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# THE
# ARCHITECT
# AND
# CONTRACT REPORTER.

## VOL. LXXXIII.

PRINTED BY
SPOTTISWOODE AND CO. LTD., LONDON
COLCHESTER AND ETON

# THE
# ARCHITECT
AND
# Contract Reporter.

A WEEKLY
ILLUSTRATED JOURNAL
OF
ART,
CIVIL ENGINEERING.
AND
BUILDING.

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*Architectura est scientia pluribus disciplinis et variis eruditionibus ornata.*—VITRUVIUS.

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VOL. LXXXIII.
JANUARY TO JUNE 1910.

LONDON:
PUBLISHED AT IMPERIAL BUILDINGS, LUDGATE CIRCUS, E.C.

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## FORTHCOMING EVENTS.

*Monday, January* 10.

Liverpool Architectural Society: Paper on "Town Planning and Architecture," by Professor S. D. Adshead, F.R.I.B.A.

Surveyors' Institution: Paper on "The Housing and Town Planning Act, 1909," by Mr. John Willmot. The discussion will include that on the paper by Mr. Davidge read on November 22.

*Tuesday, January* 11.

Illuminating Engineering Society: Discussion on "Glare, its Causes and Effects," to be opened by Dr. J. Herbert Parsons, F.R.C.S.

*Wednesday, January* 12.

Architectural Association: Opening lecture of a course on "European Mediæval Architecture," by Mr. Edward S. Prior.

Manchester Society of Architects: Paper on "Concrete and Concrete Tests," by Mr. A. E. Corbett, A.R.I.B.A.

*Thursday, January* 13.

Royal Academy: Course of Four Lectures on Painting, by Sir W. B. Richmond, R.A., K.C.B.; (1) "Design and Drawing."

Royal Society of Arts: Paper on "Art Administration in India" (Indian Section), by Mr. E. B. Havell.

*Friday, January* 14.

Architectural Association: Paper on "A Comparison between English and Continental Ironwork," by Mr. J. Starkie Gardner.

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## A FOREWORD.

By The Editor.

At the beginning of a New Year it is natural to all of us to offer good wishes and to form good resolutions. We therefore present to all our readers our good wishes for a prosperous and happy New Year, and record our resolution to do what lies in our power to assist in the realisation of those wishes. We do not, however, pretend to pose as philanthropists or wish to obscure the fact that The Architect, in common with all other technical journals, is conducted as a business and primarily for the benefit of the proprietors.

But we are fortunate in being able to feel that our business is closely bound up with the prosperity and the happiness of our readers, our contributors, and our advertisers, and that we may therefore so direct our energies that for all profit and pleasure may be the result.

For our readers we purpose to include articles on the art of architecture, the profession and the business of architects, that may afford interest and instruction to the many varied activities and enthusiasms of all. We crave the indulgence of those to whom some of the subjects on which we treat may not appeal on the ground that there are others to whom they are attractive. We are resuming in this issue illustrations of our Cathedrals, and shall continue those of the Colleges of Oxford. We commence a series of articles on Cold Storage and Refrigeration, a subject that has become of considerable importance to all architects who have to design buildings in which people live, not only hotels but private residences, besides the more obvious class of manufactories. We have other subjects in view, both practical and artistic, with which we propose to deal at length in the future. For our junior readers we have started a Students' Sketching and Measuring Club, in the hope of adding one more inducement to a branch of study of the highest value and importance, and this we trust will be well supported.

For our contributors we propose to afford the opportunity of publicity to those who have not yet reached the heights of fame, but who deserve to do so, while we hope still to be allowed to illustrate the work of masters in the art. In common with our contemporaries, we do not wish to include, save on exceptional occasions, drawings or photographs that have appeared elsewhere. There is too much good work being done now in British architecture to allow room for duplication. It is quite a common thing in an open competition to find numerous designs that, though not fortunate enough to receive a premium, well merit publicity before they are rolled up and put away on the top shelf.

For our advertisers we ask the consideration and attention of all practising architects, for it is only the support of advertisers that makes possible the existence of technical journals. If there were no advertisers there would be no illustrations in our own or any other architectural paper, and the architects who are doing good work would scarcely be known to their brother artists beyond a very small circle of intimate acquaintances. Therefore we ask our readers not to throw away the advertisement pages without a glance, and we do so the more readily because we know that these pages often help the busy practising architect to keep himself up to date in facilities for improved work and prevent him from keeping to his own little groove, which, ever deepening, shuts him off from what is going on around him.

Frederic R. Farrow.

186500

CHATEAU VICTOL PONTFOL.—Drawn by A. N. Prentice, F.R.I.B.A.

## ARCHITECTURE IN 1909.

THE year 1909 has been one of those whose end has been welcomed in the world of architecture, accompanied by a forlorn hope that its successor may have better things in store. Activity in building is admittedly subject to wave action, now rising to the height of a boom, now falling to the depths of a slump. We in this country have now experienced the deepest slump within the memory of practising architects and active builders, and as yet there appears little sign of the swing of the pendulum to a period of prosperity.

Added to the normal operations of bad trade and commercial depression,

The Budget

of the past year has exerted a most paralysing influence on all building. Confidence in any assured set of conditions under which not only speculation but investment in any form of building might be undertaken with a reasonable sense of security has been utterly abolished. Not only have the financial proposals of the Government promised burdens on building of a crushing character, but there has been inspired the worse feeling that no one can foresee what further impositions may follow.

The rich man hesitates to buy an estate and build a mansion suitable to his means when he is confronted with the probability that these may subject him to an impost greater even than his wealth can sustain. The business man will not stoop to the folly of investing his capital in bricks and mortar when he cannot possibly estimate the extent to which his outgoings may be increased by an indefinite increment of taxation. The comparatively poor man, who, out of his hard-earned savings, puts his twenty or thirty pounds into a bit of freehold at a land sale is hit hardest of all. He knows that if the land taxes of the Finance Bill of 1909 are carried into effect he cannot possibly make a profit, and may sustain an actual loss.

A period of deep depression is not that in which we may expect to find the inception of great works of architecture, and thus it comes about that the event of the year has been the completion of the

Victoria and Albert Museum,

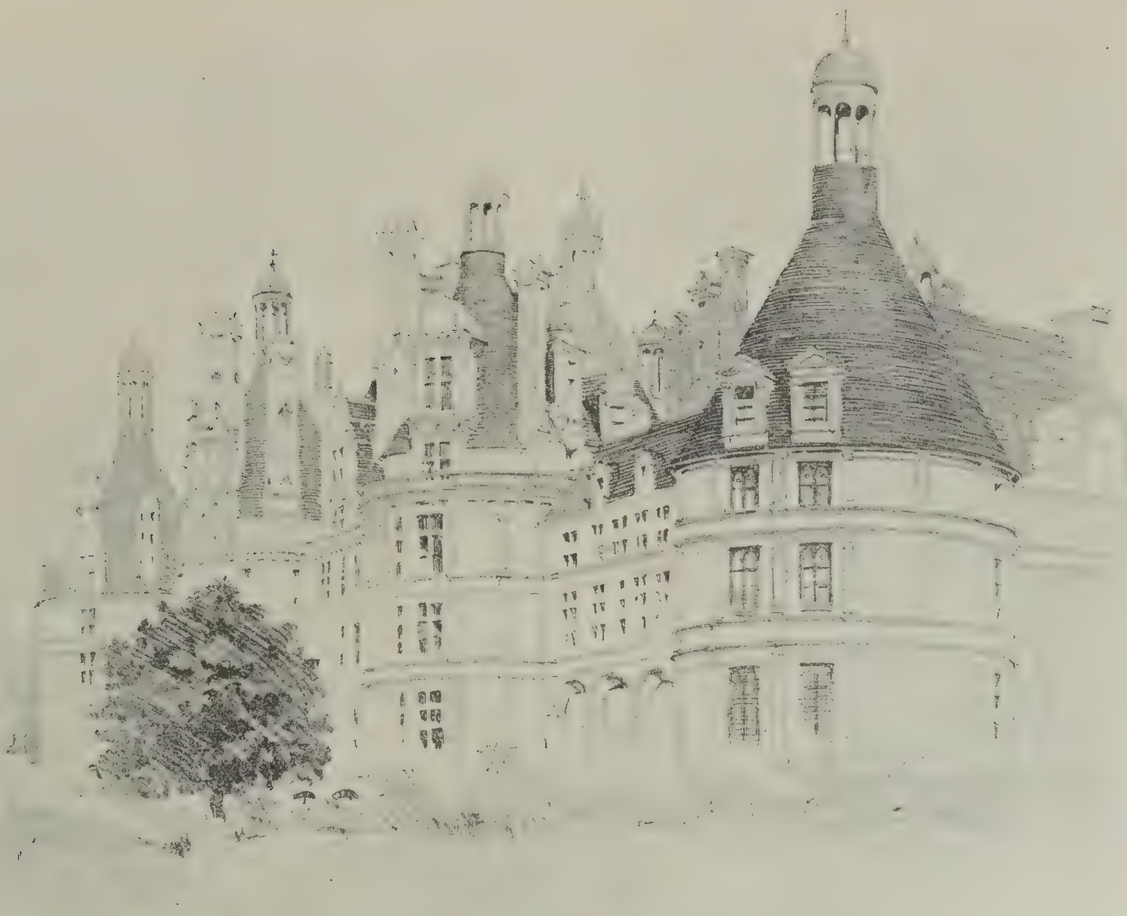
from the designs of Sir Aston Webb, R.A., notable not only as the consummation of a great building, but as the provision of an invaluable aid to the study of architecture and accessory art, in which the many treasures that have been gathered together at South Kensington can be properly seen and appreciated. In connection with the museum, the passing of the collections of the late Mr. George Salting from the condition of a loan to that of a possession of the nation is a memorable event of the year.

Of great importance in the modern history of architecture has been the passing into law of the

Housing, Town Planning, &c., Act,

and the recognition thereby enforced on the public mind of the fact that town planning should be raised from the haphazard method of muddle that has hitherto been the vogue in this country to an organised system of well directed effort in which the peculiarly architectural quality of prevision is essential. The preservation of the amenities is now by way of being recognised as of importance, not only to the comfort but to the health and social well-being of the community. It is a distinct gain to the position of architecture that beauty has come to be estimated as a vital element in our towns. Various congresses and conferences, lectures and discussions have assisted in drawing attention to the many questions that are connected with town planning, even if, as yet, they have not determined the principles far less the details of the science of laying out and building a city or a suburb as an organised entity.

The appointment of Mr. Stanley D. Adshead, F.R.I.B.A., as Associate Professor of Civic Design in the



CHATEAU D'AMBOISE.—Drawn by A. N. PRENTICE, F.R.I.B.A.

University of Liverpool is an earnest that the subject of town planning is to be dealt with seriously as a branch of architecture requiring careful study and research as well as imaginative conception to raise it to its proper sphere.

Last year has been for the

ROYAL INSTITUTE OF BRITISH ARCHITECTS

a memorable one, for it has seen the reception of the new Charter that is intended to pave the way for the attempt to make the Royal Institute more truly representative and more completely comprehensive of the body of architects in Great Britain. The new Charter has rendered necessary the modification of the by-laws of the Society, and this has occupied much time during the past session, largely by reason of the endeavour on the one hand to increase the power and autocracy of the Council, and on the other to restrict that body's independence of the general membership. At the last business meeting of the year the general body of members were surprised by the announcement that the Council is actually engaged on the drafting of a Bill for the Parliamentary sanction of—something. What that something may be remains to be seen, and whether it will satisfy the advocates of

REGISTRATION

is doubtful. Perhaps the members of the Council, the majority of whom are anti-registrationists, have recognised that there is an overwhelming preponderance of opinion among architects throughout the kingdom in favour of registration, and that it is better for those who fear evil results from its enforcement to assist in framing a Bill by which those dreaded evils may be minimised rather than to offer an uncompromising opposition to the desires of the majority.

The Royal Institute has been able during the past year to effect a solution of the problem of obtaining more roomy quarters by the acquisition of premises adjoining its previous home at 9 Conduit Street, which, if not so heroic a scheme as a fine new building might have proved, will apparently serve its purpose for many years to come.

Steel frame construction and reinforced concrete have now so far become actualities in English architecture that an

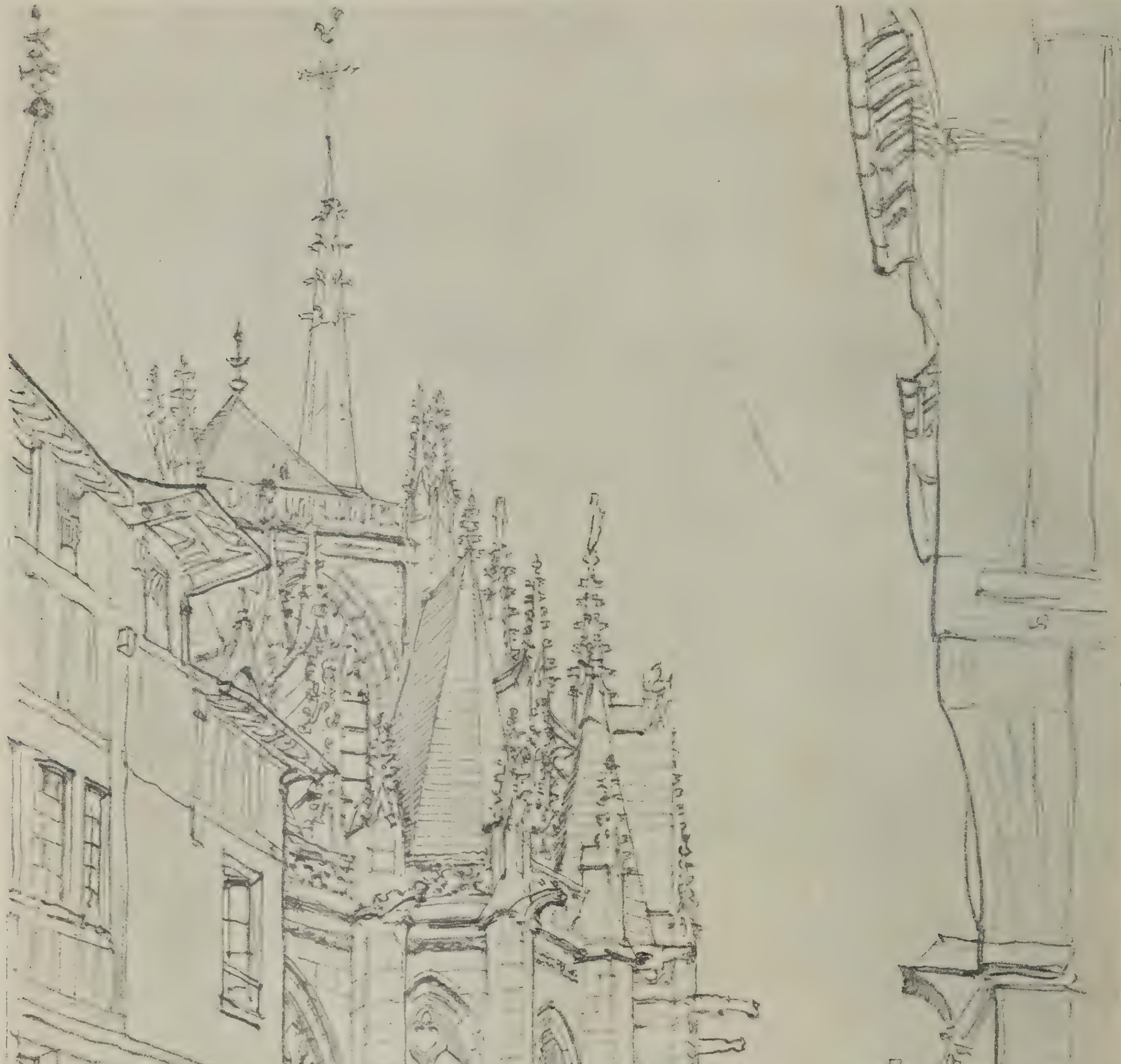
AMENDMENT OF THE LONDON BUILDING ACTS

was an urgent necessity, and has been incorporated in our statute law during the past year, thus establishing a code of regulations recognising and determining the conditions under which these methods of construction may be employed in the Metropolis. The opposition of the Royal Institute to some of the regulations proposed by the London County Council, particularly those dealing with the internal construction of steel frame buildings, was unsuccessful.

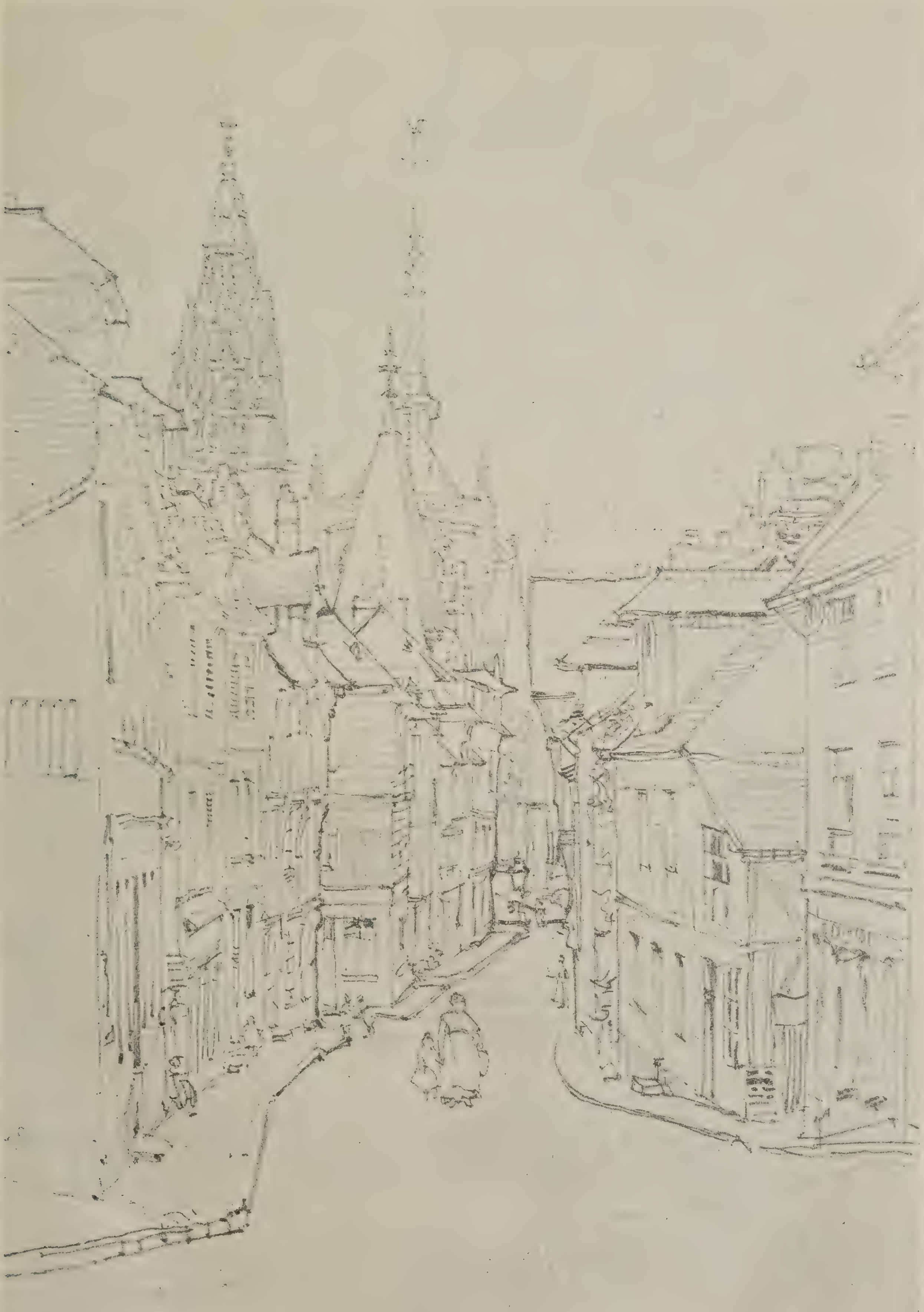
Early in the year we directed public attention to the imminent danger from fire of

ST. PAUL'S CATHEDRAL

and other national and monumental works of architecture, and we are pleased to be able to record that, under the direction of Mr. MERVYN MACARTNEY, the surveyor to the fabric, a high-pressure system of water supply has been installed at St. Paul's, which should go far to reduce the danger that formerly existed.



CAUDEBEC.—Drawn by LESLIE WILKINSON, A.R.I.B.A.



CAUDEBEC.—Drawn by LESLIE WILKINSON, A.R.I.B.A.

HOTOT FARM.—Drawn by A. N. Prentice, F.R.I.B.A.

### Liverpool's New Cathedral

has made satisfactory progress during the year, and the Lady chapel is now within measurable distance of completion, the building being roofed in and the stained glass windows inserted. The choir is also well advanced.

The Corporation of the City of London has determined on the construction of the new

### St. Paul's Bridge,

which we trust will become an ornament to the river, as well as a practical improvement to the traffic facilities of the Metropolis. The cost of this important work, as well as of the improvement of Southwark Bridge, will be defrayed from the funds of the Bridge House Estates, which trust has already done so much in the past for the benefit of the citizens of London.

### Important Buildings Completed

have not been so numerous or of such magnitude as we have been able to record during previous years, and the paucity of their number reflects the depression which has now existed for a considerable period. Among those with which the past year may be credited are the first portion of the buildings of Birmingham University, from the designs of Sir Aston Webb, R.A., and Mr. E. Ingress Bell; the extension of the Bradford Town Hall, at a cost of 86,000*l*., the work of Mr. F. E. P. Edwards, formerly the City Architect of Bradford, in consultation with Mr. R. Norman Shaw, R.A.; the premises of the British Medical Association, Agar Street, Strand, London, of which Mr. H. Percy Adams was the architect; the Northern Assurance Company's building in Moorgate Street, London, by the late Mr. E. A. Gruning and the late Mr. E. W. Mountford; the new Post Office at Hull, erected at a cost of 53,000*l*., from the designs of Mr. W. Pott, of His Majesty's Office of Works; new offices for the Grand Trunk Railway of Canada, in Cockspur Street, London, from the designs of Sir Aston Webb, R.A.; the City of London Workhouse and Infirmary at Homerton, which Mr. Albert E. Pridmore has carried out at a cost of between 50,000*l*. and 55,000*l*.; the Court of Sessions Buildings at Edinburgh, designed by Mr. W. T. Oldrieve, His Majesty's principal architect for Scotland. There have been also a large number of school buildings completed all over the country, and what activity there has been displayed in building during the past year may be said to have been largely centred in this class of edifice, both as regards buildings completed and buildings commenced.

A certain amount of work has been carried out in ecclesiastical buildings, and among the

### Churches Completed

we may note St. Andrew's, Handsworth, built from the designs of Mr. W. H. Bidlake at a cost of 11,000*l*.; the first part of St. Margaret's Church, Leeds, from the designs of Mr. Temple Moore; St. Alban's Church, Bournemouth, of which Mr. G. H. Fellowes Prynne is the architect; St. Luke's, Wimbledon Park, designed by Mr. T. G. Jackson, R.A.

### Important Works Commenced

during the year include Arbroath Railway Station, at a cost of 50,000*l*., for the Caledonian and North British Railway Companies; Wandsworth Union Infirmary, to cost 66,550*l*., for which Mr. J. S. Gibson is the architect; the extension of Aberdeen Royal Infirmary, under the direction of Mr. William Kelly, amounting to 25,000*l*.; new baths, Derby Road, Weaste, for which Messrs. Mangnall & Littlewood are the architects, and which are to cost 24,000*l*.; the Albert Mission Hall and Astor Institute, Manchester, designed by Messrs. Morley & Sons, and amounting to 55,000*l*.; the offices of the Palatine Bank, at Manchester, costing 30,000*l*., for which Messrs. Briggs, Wolstenholme & Thornely are the architects; the Liverpool Royal Infirmary Building from the designs of Mr. J. Francis Doyle, which is estimated to cost between 25,000*l*. and 30,000*l*.; the Post Office extension at Bristol, designed by Mr. John Rutherford, of His Majesty's Office of Works, the anticipated expenditure on which is 40,000*l*.; the extension of Belfast Asylum at a cost of 70,000*l*., for which Messrs. Graeme, Watt & Tulloch are the architects; the central building of the Y.M.C.A., Tottenham Court Road, London, for which Mr. Rowland Plumbe is the architect, and which is estimated to cost 90,000*l*.; the new building of the General Accident Assurance Corporation, Aldwych, London, designed by Mr. J. J. Burnet; new offices for the Anglo-American Oil Company, Queen Anne's Gate, London, for which Mr. Ernest Runtz is the architect;

CHATEAU FUMICHON.—Drawn by A. N. Prentice, F.R.I.B.A

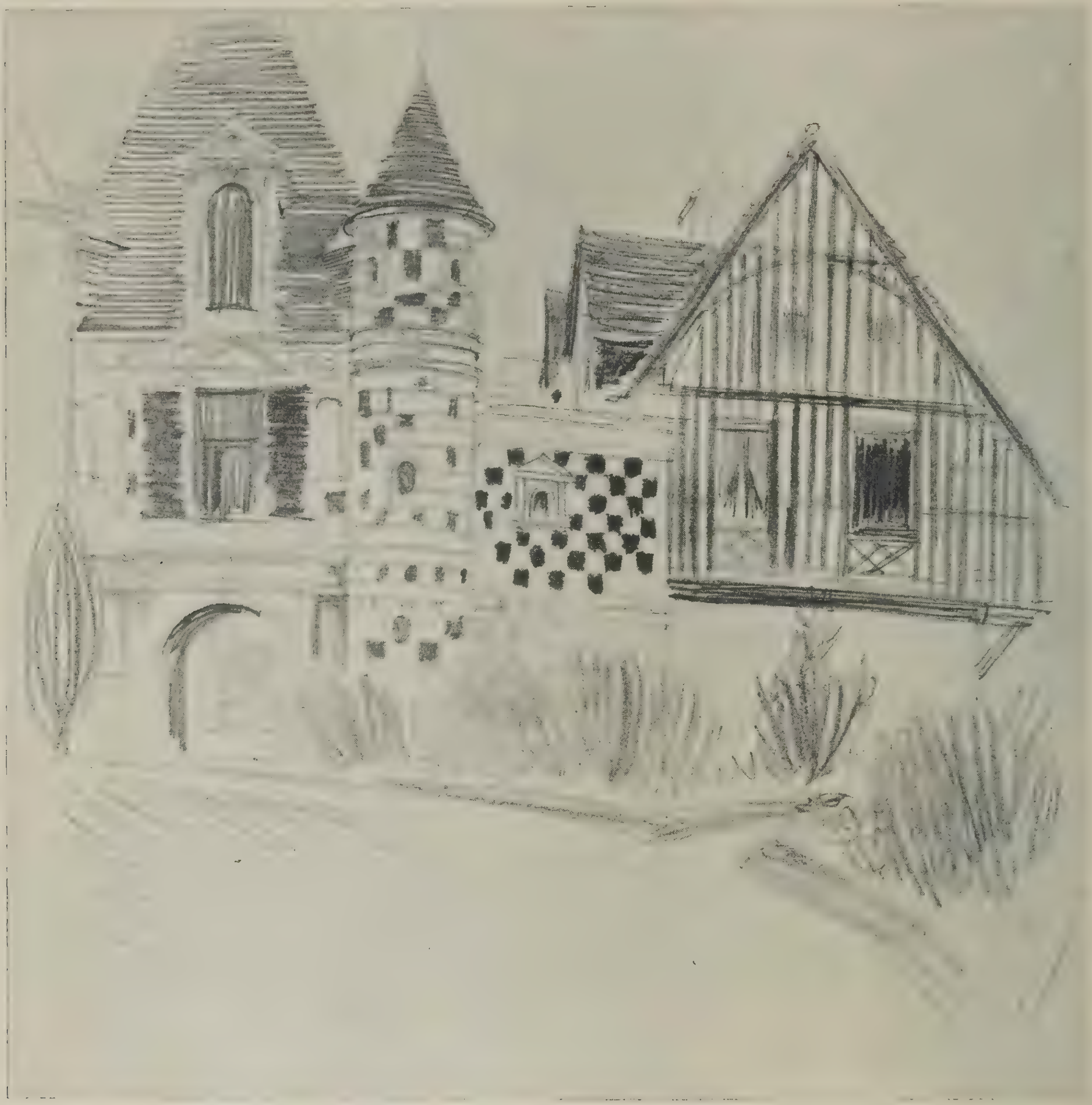
new Royal Infirmary buildings for Perth City and County, the cost of which, from Mr. James Miller's designs, is estimated at 36,800*l.*; Town Hall and Municipal Buildings, Torquay, to cost 30,000*l.*, Mr. Thomas Davison having secured the appointment as architect in open competition; Glasgow Infirmary extension, amounting to 80,000*l.*; New Grand Hotel, Sheffield, by Messrs. Connon & Chorley; new offices for the Woods and Forest Commission, designed by Mr. John Murray; Cardiff Infirmary, at a cost of 32,851*l.*, by Mr. E. M. Bruce Vaughan; Napsbury Asylum, Middlesex, 56,948*l.*, by Mr. Rowland Plumbe; additional offices for the Royal London Mutual Insurance Company, designed by Mr. John Belcher, R.A., to cost about 24,000*l.*; lunatic asylum, Mile End, for the county of Essex, for which Messrs. King & Son's tender at 189,691*l.* has been accepted, Messrs. F. Whitmore & W. H. Toun being the architects; and the raft foundation and retaining walls for the London County Hall, for which Messrs. F. & H. F. Higgs's tender at 46,900*l.* has been accepted.

### New Churches Commenced

include St. Ambrose, Bristol, designed by Messrs. W. V. & A. R. Gough; St. Michael and All Angels, Summertown, of which Mr. A. Mardon Mowbray is the architect; Methodist church at Dunstable, for which Messrs. Withers & Meredith are the architects; memorial church of St. Philip, Litherland, Liverpool, by Mr. J. Francis Doyle; St. Michael, Newquay, from designs by Mr. J. N. Comper; St. Martin's, Worcester, and St. Mark's, Woodcote, Purley, for both of which Mr. G. H. Fellowes Prynne is the architect; St. Saviour's, Westcliff, by Messrs. Hoare & Wheeler.

### Competitions

decided during the year have largely been limited in number of participants either by geographical or other basis of selection. Amongst those to be noted are that for the Bristol Royal Infirmary, Mr. Edwin T. Hall being the assessor, and the places of honour being awarded to Mr. H. Percy Adams, Messrs. Henman & Cooper, and Messrs. Worthington & Son; for the Cornwall County Council offices, in whch Mr. G. H. Fellowes Prynne placed Messrs. Silcock & Reay first, Messrs. Pearson & Milburn second, and Messrs. Warwick & Hall third; for Blackpool Library, in which Messrs. Cullen, Lochhead & Brown were placed first by the assessor, Mr. G. H. Willoughby, and there were bracketed equal for second place Messrs. Cooper & Slater, Mr. H. R. Gardner, Mr. C. H. Potter, Messrs. Russell & Cooper, Messrs. Thomson & Bristow; for additions to Whittingham Asylum, Lancashire, the premiated designs being by Messrs. Sykes & Evans, Mr. Percy D. Lodge, and Messrs. Appleyard & Quiggin; for branch offices at Leeds for the Pearl Life Assurance Company, for which Mr. Percy Monckton, the assessor, selected the design of Mr. William Bakewell; for Middlesbrough Library, in which Mr. J. S. Gibson, the assessor, placed the design of Messrs. Russell & Cooper first, that of Messrs. G. H. Wenyon & Chas. H. Potter second, and that of Messrs. Cooper & Slater third; for the National Library of Wales, in which Mr. Sydney K. Greenslade's design, estimated to cost 85,000*l.*, was selected by the assessor, Mr. Reginald Blomfield, A.R.A.; for the extension of the Victoria Buildings, Liverpool University, in which the assessor, Mr. Guy Dawber, placed first the design of Messrs. Briggs, Wolstenholme & Thornely; for Town Hall and Law Courts, Burslem, in which Mr. H. T. Hare, the assessor, awarded the first premium to Messrs. Russell & Cooper, the second to Mr. E. Montague Thomas, and the third to Messrs. Warwick & Hall; for extension of Town Hall, Stoke-on-Trent, in which Messrs. Garratt & Simister were placed first, Messrs. Warwick & Hall second, and Mr. William Heywood third by the assessor, Mr. Leonard Stokes; for Berkshire County Council offices, in which the premiums went to Messrs. Warwick & Hall, Mr. E. J. Shrewsbury, and Messrs. Wills & Anderson, Mr. Mervyn Macartney being the assessor; for extension of Grimsby Town Hall, in which Sir W. Alfred Gelder, the assessor, placed Messrs. Eade, Johns & Browne first, Messrs. Withers & Meredith second, and Messrs. Rigby, Oliver & Phipps third; for Girls' School, Harrogate, to cost 46,000*l.*, a limited competition, in which Mr. H. W. Chatters, the assessor, selected the design of Mr. W. Gilbee Scott; for Training College, Hull, in which the premiated designs were those of Messrs. Crouch, Butler & Savage first, Mr. W. H. Thorp second, Mr. G. H. B. Gould third, Mr. John W. Simpson being the assessor; for Isolation Hospital, Aberdare, in which Sir William Emerson and Dr. W. Williams,



CHATEAU ST. GERMAIN DE LIVET.—Drawn by A. N. Prentice, F.R.I.B.A

the assessors, placed Mr. **Edward C. H. Maidman** first, Messrs. **Stockdale, Harrison & Sons** and Mr. **Howard H. Thomson** second, and Mr. **E. Montague Thomas** third.

### Honours and Appointments

during the past year include the gift of the Royal Gold Medal to Dr. **Arthur John Evans**, the bestowal of a C.B. on Sir **Aston Webb**, R.A., the elevation of Mr. **John Belcher** to the full rank of Royal Academician, the appointment of Mr. **John Slater** as a member of the Tribunal of Appeal under the London Building Act.

### Obituary.

The past year has removed from among us Mr. J. H. **Richardson**, Mr. **James Neale**, Mr. J. L. **Murray**, Mr. R. H. **Boyce**, Mr. E. A. L. **Ould**, Mr. **Cole A. Adams**, Mr. W. W. **Bethell**, Mr. A. H. **Paget**, Mr. C. J. H. **Cooper**, Mr. T. M. **Reade**, Mr. J. M. **Taylor**, Mr. H. D. **Bryan**, Mr. N. S. **Joseph**, Mr. H. **Stock**, Mr. J. W. **Penfold**, Mr. J. A. **Campbell**, Mr. W. **Owen**, Mr. H. **Hall**, Mr. F. H. **Pownall**, Mr. F. H. **Williams**, Mr. T. **Worthington**, Mr. M. A. **Hennessy**, Mr. H. B. **Garling**, Mr. G. C. **Sherrin**, Mr. T. W. **Cutler**, Mr. A. B. **Rowe**.

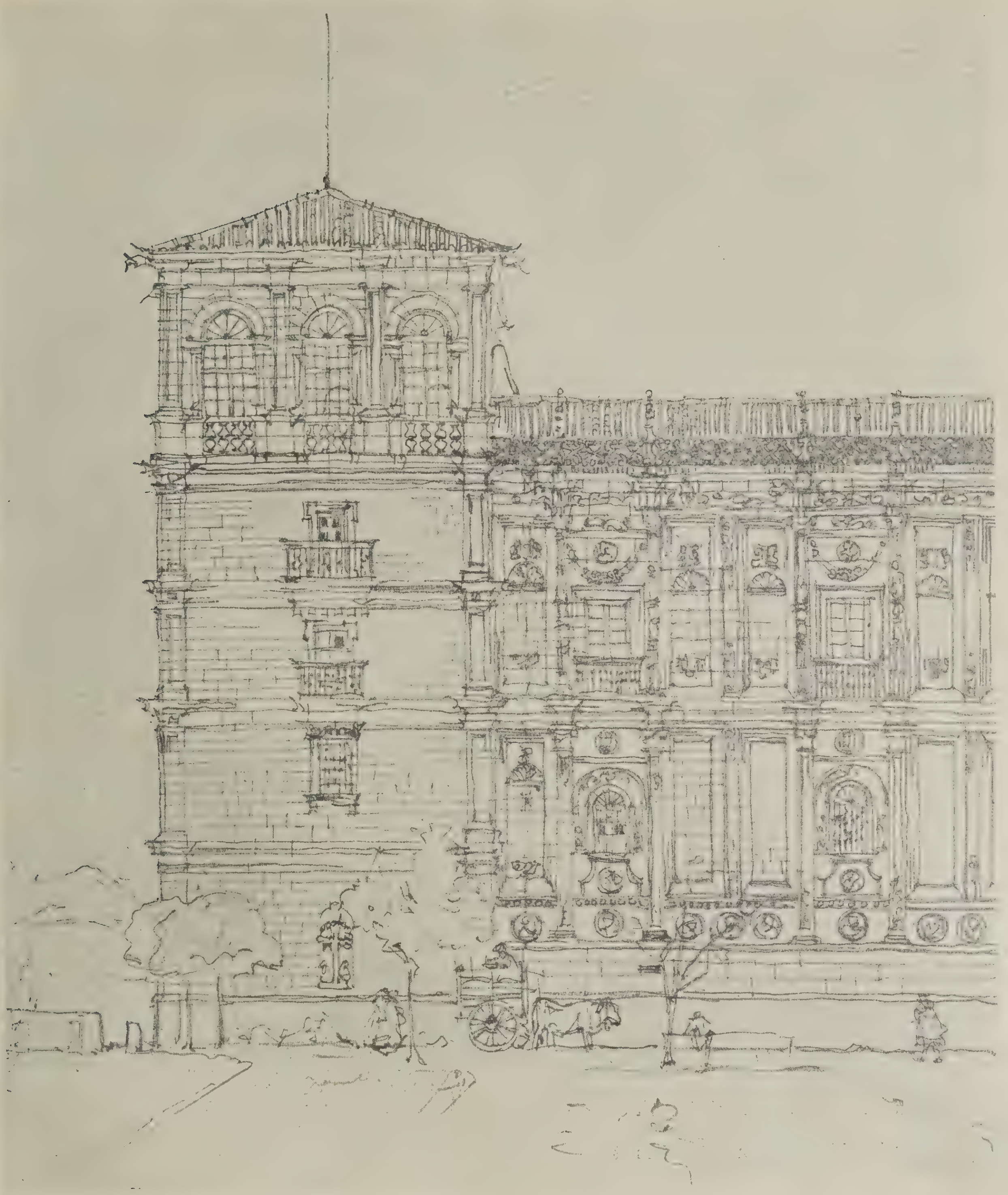
## NOTES AND COMMENTS.

Several members of the Royal Institute journeyed to Conduit Street on Monday last, some from long distances, to discuss the amended Regulations for Architectural Competitions which have been placed in the hands of members, but this part of the agenda was not reached, as practically the whole evening was occupied with the consideration of quite private and personal matters of little general interest. These concerned largely the doings of some members of the Practice Standing Committee, and at least showed what we have before urged, the necessity for a code of professional ethics or etiquette which should define what is and what is not proper professional conduct in an architect.

At present members of the Council and other architects of high standing do things that some ordinary members consider are derogatory to their professional standing, and, on the other hand, the men on the front bench deem practices adopted by some of the rank and file unworthy of professional men. In the present chaotic state of opinion each is inclined to "atone for sins he is inclined to by damning those he has no mind to."

The Practice Standing Committee would seem to be the proper body to draft such a code for the discussion and acceptance of members generally, and until they do so members of that Committee ought in their own practice to be especially careful to do nothing that can be considered by the most captious as in the least degree questionable or indiscreet. This Committee is at present, to some extent, the *censor morum* of the profession, and the conduct of its members should be, like that of **Cæsar**'s wife, above suspicion.

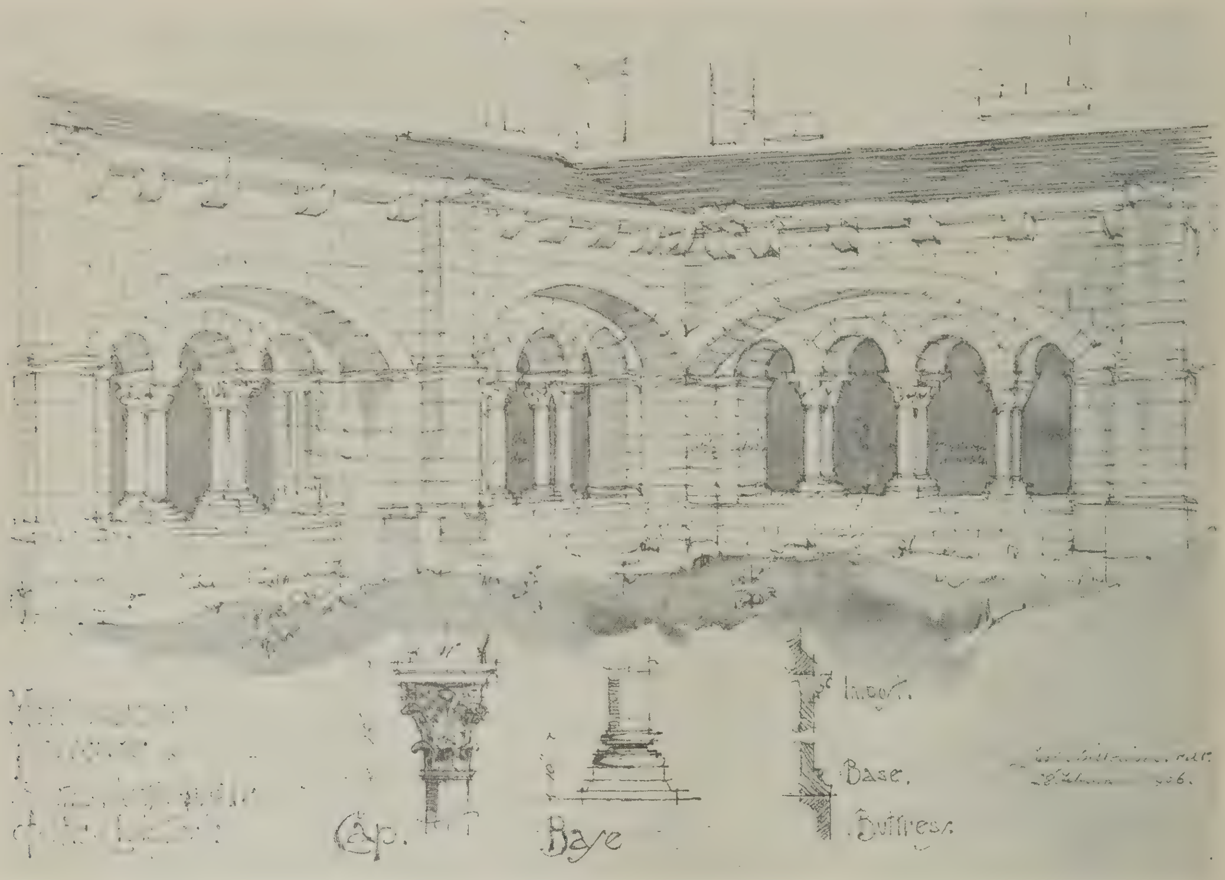
In our advertisement pages will be found the regulations and particulars of subjects for our Students' Sketching and Measuring Club, which we trust will receive warm



THE CONVENT OF SAN MARCOS, LEON.—Drawn by LESLIE WILKINSON, A.R.I.B.A.

support from a large number of the younger members of the architectural profession, for whose benefit it is intended. The measurement of old work is now scarcely so popular as it was in the days of Gothic enthusiasm, but it is still, in our opinion, an essential part of a young architect's training, for it is only by careful measurement that the niceties and refinements of design in architecture can be observed and appreciated. Sketching gives the student a knowledge of the effects produced, but measurement is necessary that he may learn how those effects are produced. This holds good of Renaissance designs as well as of Mediæval or Classic. The difference that we feel between the work of INIGO JONES and WREN, between that of GIBBS and HAWKESMOOR, is scarcely definable in words or in sketches; its nature must be examined by actual measurement.

THE Master of the Charterhouse, the Rev. GERALD S. DAVIES, M.A., in a letter to the *Times*, makes a suggestion with regard to the annual exhibitions of the Royal Academy, with which we cannot but agree. He proposes that the summer exhibition should be devoted entirely to paintings in oil, and that sculpture, water-colour, black-and-white and architecture should be allotted the winter exhibition. It is obvious to all that at present the Royal Academy apparently recognises but one art, that of painting in oil, and that all other forms of art are grudgingly given a corner on sufferance. There would, we fancy, be no unwillingness on the part of painters in oil to find more space available for their pictures in the summer exhibition, whilst the practitioners of the other art crafts, including architecture, would rejoice in a better opportunity of displaying their work if only at a winter exhibition. The



Drawn by Leslie Wilkinson, A.R.I.B.A.

success of the Grafton Gallery exhibition of old masters relieves the Royal Academy of its dutiful but unprofitable necessity for an exhibition on the old lines.

Signor Nathan, the Syndic of Rome, is hardly going the right way to pave the path of success for the great exhibition that is to be held in the Eternal City next year. Most Englishmen, in common with the citizens of other nations, like and admire Italy, and would do what they could to further the success of Rome's exhibition. But Signor Nathan, with the Council of which he is the head, is not content with opposing those of his own countrymen who value the remains of Italy's artistic and historic past, but flouts all art-lovers who have the impertinence to support the views of the cultured artists and archæologists of Italy, and tells them to mind their own business and stay at home. Hence the present newspaper campaign against the foreigner in Italy, but we need not get excited over the ebullitions of the present representatives of the S.P.Q.R.

The municipality of Paris takes a large view of the amenities of the city when it asks Parliamentary sanction for a loan of 36,000,000*l.* for improvements to the town planning, the removal of insanitary areas, the repaving of streets, the provision of new promenades and squares, the repair or rebuilding of public edifices. Included amongst the improvements is that of school buildings, the completion of the public markets, and the provision of sanatoria to aid in the fight against tuberculosis. We wish the City of Paris success in its enlightened enterprise.

Holme Lacy, near Hereford, is one of the treasure houses of English domestic art, and the sale of its contents on the last day of this month and three following days will afford a grand opportunity for the collector of seventeenth and eighteenth century furniture, of tapestry, of pictures, and of a magnificent series of carvings by Grinling Gibbons.

## LLANDAFF CATHEDRAL.*

By S. Bowen Williams, M.S.A.

The subject of Llandaff Cathedral is one that, if properly treated, is capable of inducing a great deal of pleasure and interest; for a cathedral is, as it were, a materialised epitome of the various changes and vicissitudes through which the people in the vicinity have passed during the ages that the cathedral has been in existence. We see in its early beginnings the budding of a religious feeling, then its development onwards to fruition; we see the story of the trials and tribulations which troublous times have brought upon the people in the picture of the desolation which has overtaken the fabric at certain times; and again later the revival of a religious fervour portrayed in the restoration of the beloved walls. This is more or less true of all mediæval cathedrals, but it is especially the case with Llandaff Cathedral.

To anyone with the least spark of imagination in his veins, or the least love for the history of his country and his Church, it is a source of the most profound pleasure to linger in the vicinity of such a building or to loiter through its aisles, conning and reading, in signs known and easily recognised by the professional eye, the ancient history of the building, and seeing here and there indications, more eloquent than words, of the great labour and love which have been expended in its erection. A roughly hewn capital here, a queer hieroglyphic there, a rediscovered fresco in one place, or a mutilated reredos elsewhere, all have a meaning to the trained eye, indications of the various changes which time has brought about. The time spent in deciphering old inscriptions or examining old monuments, delineating some moulding, &c., is not lost, but opens up a new vista of ancient lore, and at the same time creates a love for the underlying professional work which is of immense value to the architectural student.

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* See Illustration.

Compton Wynyates.
from the S.W.
L.W. 2.8.05

COMPTON WYNYATES.—Drawn by LESLIE WILKINSON, A.R.I.B.A.

But to proceed from the general to the particular. First of all we will give a skeleton history of the cathedral we have in mind, and then touch upon the various features of architectural interest which strike an inquiring visitor.

Llandaff is a Welsh word meaning "the church (llan) on the Taff." The see is one of the oldest in the kingdom, being second only to that of Sodor and Man. We have no authentic records of the foundation, and this is one very unfortunate circumstance connected with the church. Few records were ever kept, and most of these even have been destroyed. There is a tradition that King LUCIUS built a church at Llandaff about the year 170, but this rests on very shallow foundations. It is certain, however, that a Welsh bishop, either of Caerleon or Llandaff, was present at the Council of Arles in France in the year 314, and it is also believed that a Bishop of Llandaff was present at a Council held near Bristol in the year 603 by St. AUGUSTINE. The founders of this early church, so far as evidence and not tradition goes, were Saints DUBRICIUS (or DYFRIG) and TEILO, and their remains are said to be buried in the present cathedral. They were the real authentic pioneers of the church, and to them is due the credit of establishing the Christian faith on a firm basis in the district.

What kind of a church was that of Saints DUBRICIUS and TEILO we have no means of knowing, for there are absolutely no remains whatever. The history of the present cathedral dates from the twelfth century, and the church of Saints DUBRICIUS and TEILO was swept away to make room for the new one.

Bishop URBAN was appointed in 1107 by the Normans, and he at once began to erect a new church on the site of the old one. This cathedral of URBAN's was a small one, and during the succeeding generations underwent many alterations and additions.

During the Early English period it was extended westward as far as the present west front, and the gable portion of this front presents unchanged its appearance in the beginning and middle of the twelfth century. A tower was raised on both sides of this front, that on the north side being slightly the higher of the two.

A short time afterwards the chapter-house was added, in the Early English style, and somewhere between the years 1270 and 1290 the Lady chapel was built by Bishop DE BRAOSE, who lies buried there. The Lady chapel exhibits traces of the transition to Decorated work. The large and notable Norman archway between the presbytery and the Lady chapel is a retained portion of URBAN's church.

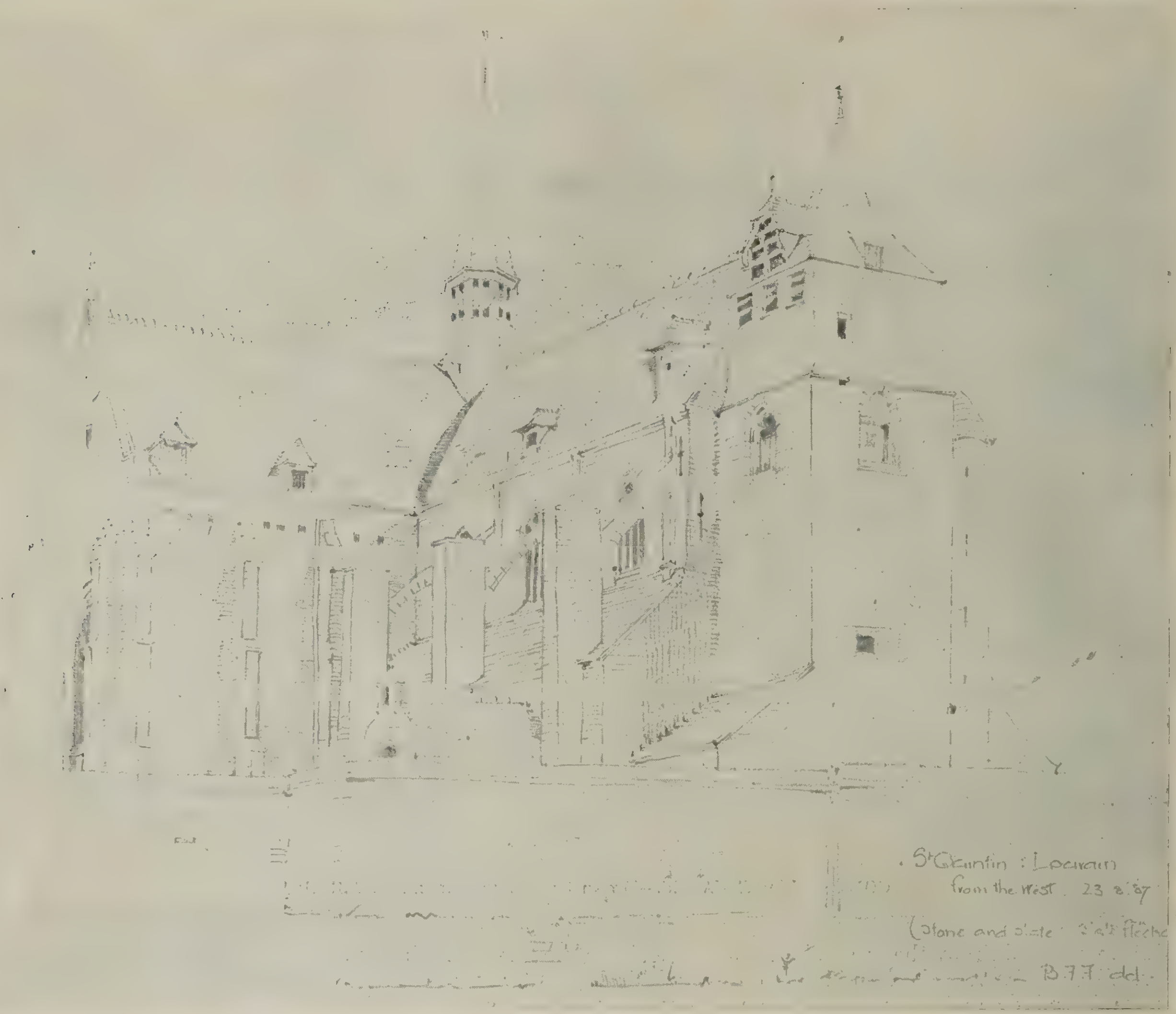
Later on it became necessary to rebuild the walls of the presbytery, and at the same time the aisle walls of nave and choir were pulled down and rebuilt. In the latter case two Norman portals were retained, though it is probable their position has been altered.

Some time afterwards the tower on the north-west angle was rebuilt in the Perpendicular style by JASPER TUDOR, uncle of King HENRY VII.

This was the last structural alteration the cathedral underwent, and so after two or three hundred years the cathedral was a completed one, having passed through the same changes which most of the Norman churches suffered.

It may be as well to pause here a moment and try and fix in our mind's eye the appearance it presented. It was small in size, with a long, unbroken length of roof over nave and choir. This, with the lack of transepts, must have given it the appearance of a large parochial church rather than a cathedral. There was no spire at the west end, but two towers, the tower which the present spire has replaced being lower and plainer than that on the north side. The chapter-house roof was of low pitch, and generally the whole could not have been particularly attractive. Inside it was doubtless more pleasing, the long, unbroken roof and main arcade giving it a certain dignity and grace.

This then was the state of the cathedral for some 150 years; but about the middle of the sixteenth century, during the time of the Reformation, it began to suffer



St Quentin : Lorrain
from the West. 23.8.'07
(Stone and slate [illegible] flèche
B.F.F. del.

Drawn by Banister F. Fletcher, F.R.I.B.A.

sadly from neglect and decay, even more so than any other cathedral in the country.

There had never been a resident bishop and no episcopal residence. The various bishops had alienated the land of the see, and it was in a very poverty-stricken state. In 1575 the cathedral was in absolute ruin, and the number of persons on the chapter was reduced in order to obtain funds. The remains of various residences attached to the cathedral were used as pig-sties and stables, and the church was described by a contemporary writer as "dug in pits and more like a desolate and profane place than a house of prayer." Later on, during the civil war between Charles I. and the Parliament, the cathedral suffered still more, and there is a tradition that Oliver Cromwell stabled the horses of his troops within the walls of this desolated and desecrated church. Be that as it may, the revenues of the see were confiscated in 1649, the year of King Charles's execution, and the library was dispersed and destroyed. The Royalists of the county were summoned to Cardiff Castle on a cold winter's day and were shown a fire at which to thaw themselves. To their intense indignation they found that the fire was fed with the prayer-books and part of the library of the cathedral.

(*To be continued.*)

## ILLUSTRATIONS.

### LIVING ARCHITECTS.—NO. 28, MR. EDWIN L. LUTYENS, F.R.I.B.A.

MR. LUTYENS has made his mark in English architecture chiefly by his domestic work, which is ever characterised by originality and infinite variety. No one can speak of a "Lutyens style," for he is continually trying new ideas in plan, in composition and in texture, and usually with success. Although he has but recently joined the R.I.B.A., his reputation speedily led to his election on the Council.

### NO. 29. SIR ALFRED BRUMWELL THOMAS, F.R.I.B.A.

SIR BRUMWELL THOMAS is one of the younger generation of our prominent architects, and has attained his position by success in open competitions, principally in designs for municipal buildings. His most notable works have been those at Belfast, Stockport, and Woolwich.

### HEATHCOTE, ILKLEY.—THE ENTRANCE—THE HALL.

THIS is one of Mr. Lutyens's latest works and a good example of the originality of treatment with which he uses the vernacular language of architecture.

### CATHEDRAL SERIES, LLANDAFF.—EAST END OF LADY CHAPEL.

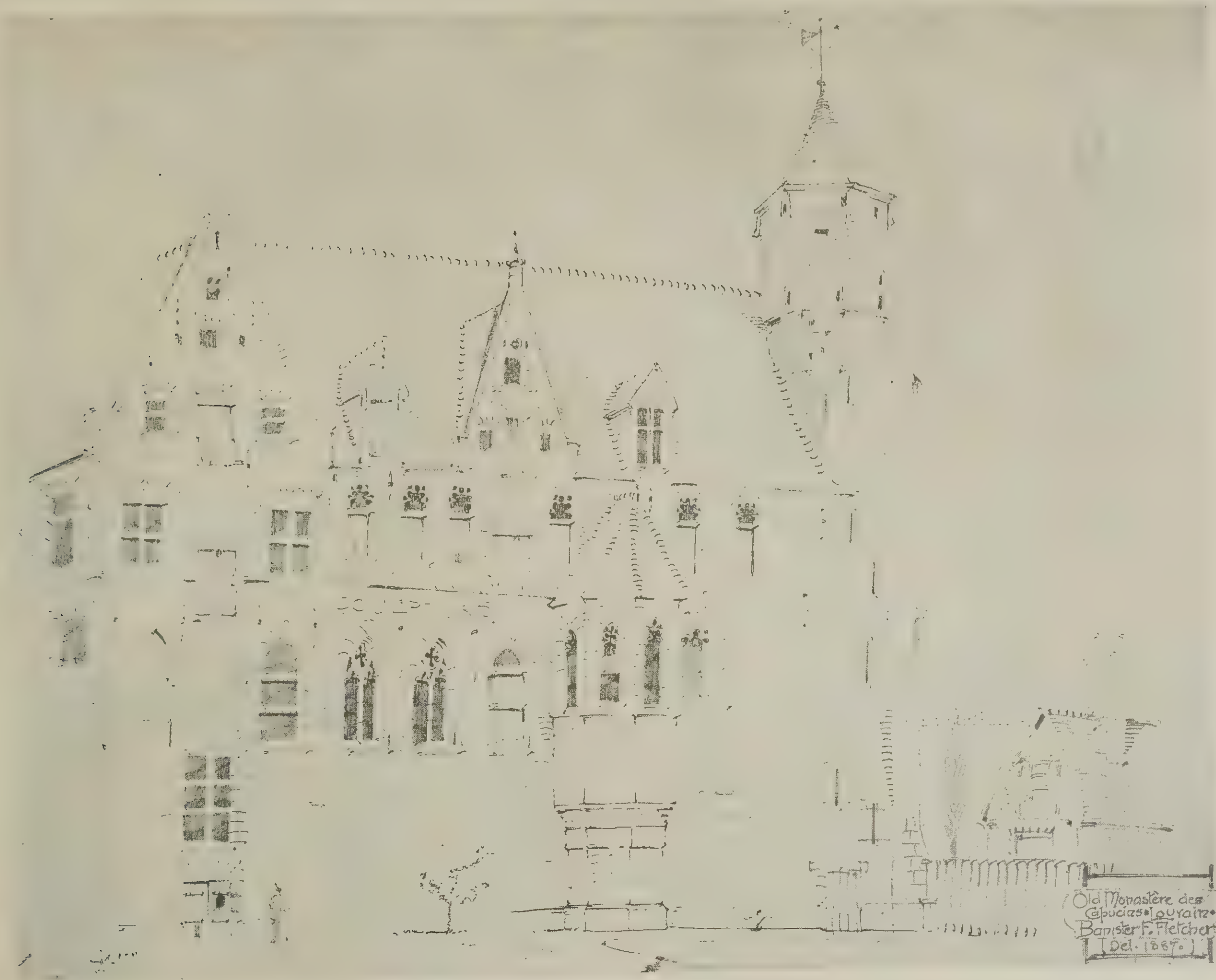
WITH this view from the eastward we resume our series of the Cathedrals of England and Wales, and shall continue with several other illustrations. An account of the cathedral will be found on page 10.

### GNS FOR CHURCH FITTINGS.

THIS drawing was exhibited in the Royal Academy, 1909, and is interesting as an example of modern English church architecture. The architects are Messrs. J. Gibbons & Son.

### MOSQUE OF OSMAN III., CONSTANTINOPLE.
### MOSQUE OF SULEIMAN I., CONSTANTINOPLE.—VIEW FROM SOUTH-WEST.

THESE drawings by Mr. Jas. B. Fulton, A.R.I.B.A., illustrate good examples of the characteristic architecture of Constantinople under Mohammedan rule.



Drawn by BANISTER F. FLETCHER, F.R.I.B.A.

## BEAUTY IN ARCHITECTURE,

By B. R. GRIBBON.

BEFORE we can proceed to define what is meant by "beauty" in architecture, we must decide as to what we wish to convey when we speak of "beauty" in any connection; that is, what constitutes beauty. It is perhaps the most difficult of all abstract principles to define, for we are so readily sensible of its presence, from the effect it produces on the emotions, that it rarely occurs to us to attempt an analysis of the qualities which combine to produce the result as a whole.

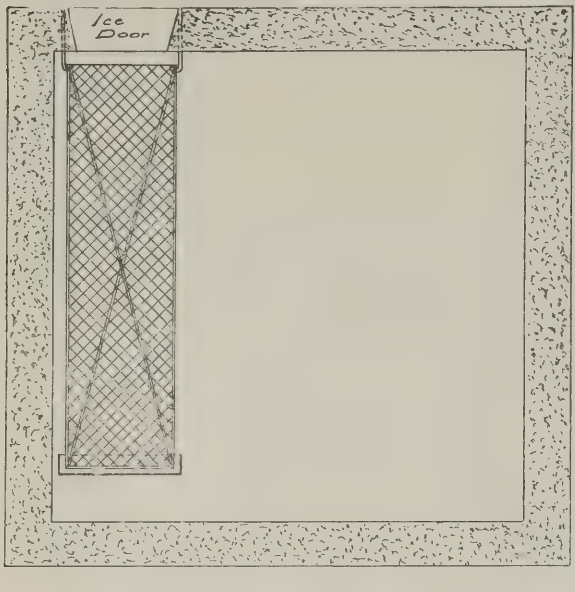
Beauty then, in the abstract, appears to be that combination of qualities which attracts and sustains the interest, and which by approximating, however remotely, to perfection of expression, incites the imagination to conceive a closer approach to the ideal. It thus acts as a living principle animating a quiescent medium, rendering it capable of expressing all its essential qualities; and the more perfectly it effects this result, the more powerfully it affects the emotions, and, by the very directness of its appeal, affords the highest form of mental pleasure. It may be said that beauty is the language of truth; but while all perfect beauty *is* the expression of truth, it does not follow that all truths must be beautiful when translated into sensible form. There are a vast number of truths, material, scientific, spiritual, which are inherently repellent, and the most faithful and perfect expression of their meaning could only succeed in increasing the instinctive aversion they produce, exactly the reverse of the effect of beauty. Beauty is therefore the perfect expression of an attractive truth.

Now, accepting this general definition of beauty, what is the fundamental truth of architecture? What is the reason for its being? It is essentially a means to an end; it is the provision in artistic form of the fulfilment of material requirements, and it is the adaptation of these requirements in the manner best calculated to express them pleasingly in the form of the completed building which constitutes that distinction which marks the difference between mere building and architecture. It would be difficult to improve upon Inigo Jones's definition of the ideal in this art, that it must be "solid, proportional according to rules, masculine and unaffected." Exception might be taken to the proportion being necessarily "according to rules," but if for these rules we take the recorded experience and the results of experiments of bygone masters of the art, not the mere text-book figures of any one architect, there is surely little to urge against it.

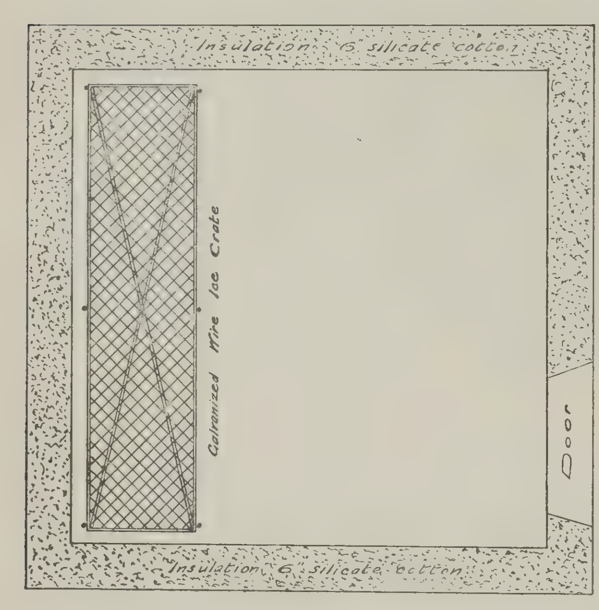
So we have as the essentials by which the truth—the purpose and meaning of each building—is to be expressed: solidity, proportion, vitality and strength, the most masculine characteristics, and freedom from all affectation, and each of these implies rather a group of qualities than one complete in itself.

First take solidity. This implies that the building must be solid in appearance as well as in fact. It must possess repose and breadth, giving it an appearance of assured purpose, and every detail must be carefully subordinated to the whole. It must convey the impression that the designer has thoroughly grasped the requirements he had to fulfil; and having done so, has grouped them together as a single whole to be incorporated in one complete design, an impression which can only be communicated by perfect unity in the design, and unity is essentially solidity. Stability must appear to be assured, and every opening must be supported by a surrounding mass of solids sufficient to prevent the impression that it weakens the structure. The lines of the design must suggest that it is firmly placed upon the ground, and this effect is greatly helped if the main lines gradually converge inwards as they rise, and it is also assisted by massing the heaviest, plainest, and strongest materials at the base. Note in the Parthenon how the fluted columns lead the eye upward from the plain stylobate to the comparative richness of the carved metopes and the long lines of exquisite mouldings which relieve the massive entablature. Notice how these mouldings emphasise and give prominence to the sculptures of the pediments, passing above and below them, and, with their delicately shaded outlines, insisting on the contrast between these sculptures and the bold lines of the triglyphs below.

(*To be concluded.*)

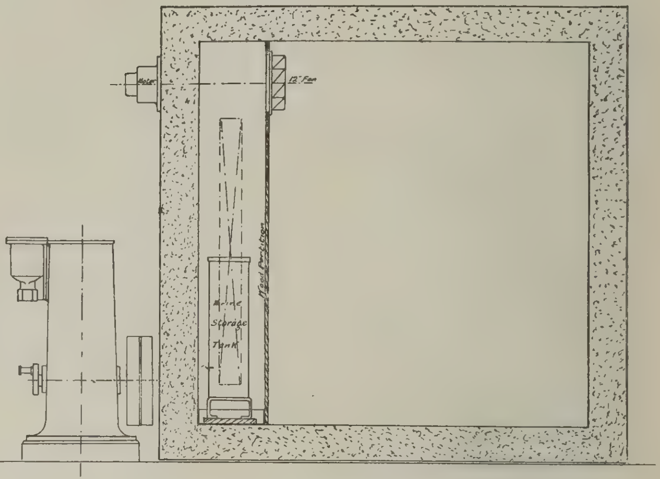


Elevation

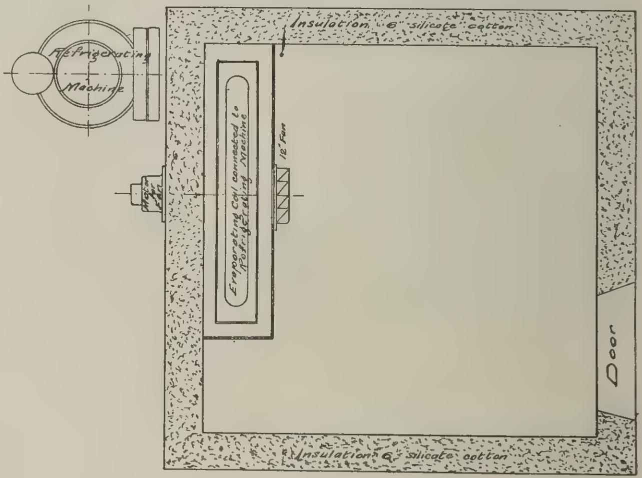

Insulation 6" silicate cotton
Galvanized Wire Ice Crate
Door
Insulation 6" silicate cotton

Plan

Fig. I



Elevation


Insulation 6" silicate cotton
Refrigerating Machine
Motor for Fan
Evaporating Coil connected to Refrigerating Machine
12" Fan
Door
Insulation 6" silicate cotton

Plan

Fig. 2

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

I.

THE real development of the science of refrigeration is practically all concentrated within the last thirty years. Even in the late 'seventies its application on a practical scale was still regarded as merely the day-dream of a few irresponsible geniuses, and it was not until the introduction of the Bell-Coleman machine in 1879 that refrigeration was taken seriously by the commercial world at large. But the enterprise of the promoters of this system, in fitting their machine to the s.s. *Circassia*, of the Anchor Line, and carrying successfully the first cargo of dead meat from America, at once opened the eyes of the public. The s.s. *Strathleven* followed from Australia in 1880, and from that time forward the success of refrigeration was assured.

Previous to 'seventy-nine, beginning with Perkins in 1834, there had been many attempts to introduce a commercial form of the refrigerating machine, but, although some of these machines appear to have done fairly good work, their owners evidently lacked the courage of their convictions, or, what is more likely, the capital and influence necessary to place their inventions on the market. Notable among them were the machines of Windhausen (Austrian), one of which produced 30 cwt. of ice per hour at the Vienna Exhibition in 1870, and those of two celebrated Frenchmen, MM. Carré and Pictet, the first of these being on the absorption principle, and the second, sulphurous anhydride compression.

But although, previous to the success of the Bell-Coleman machine, the attitude of the practical world towards refrigerating engineers had been distinctly sceptical, from the date on which the *Circassia* discharged her cargo onwards progress has been rapid, and the day-dream of the 'seventies is now the basis of a prosperous and fast developing industry. Not only is the present market steadily expanding, but new applications, as the result of scientific research and experiment, are continually being discovered, and the sphere of usefulness of refrigeration is, at the present time, very wide indeed. All public cold stores and ice factories naturally depend for their existence on the freezing machine, but it is also an indispensable adjunct in breweries, public abattoirs, bacon factories, large dairies and creameries, and is very extensively used by butchers, provision merchants, fishmongers, and poultry dealers. Up-to-date hotels and country mansions are incomplete without either mechanical or ice refrigeration, and other important applications are

Drawn by Banister F. Fletcher, F.R.I.B.A

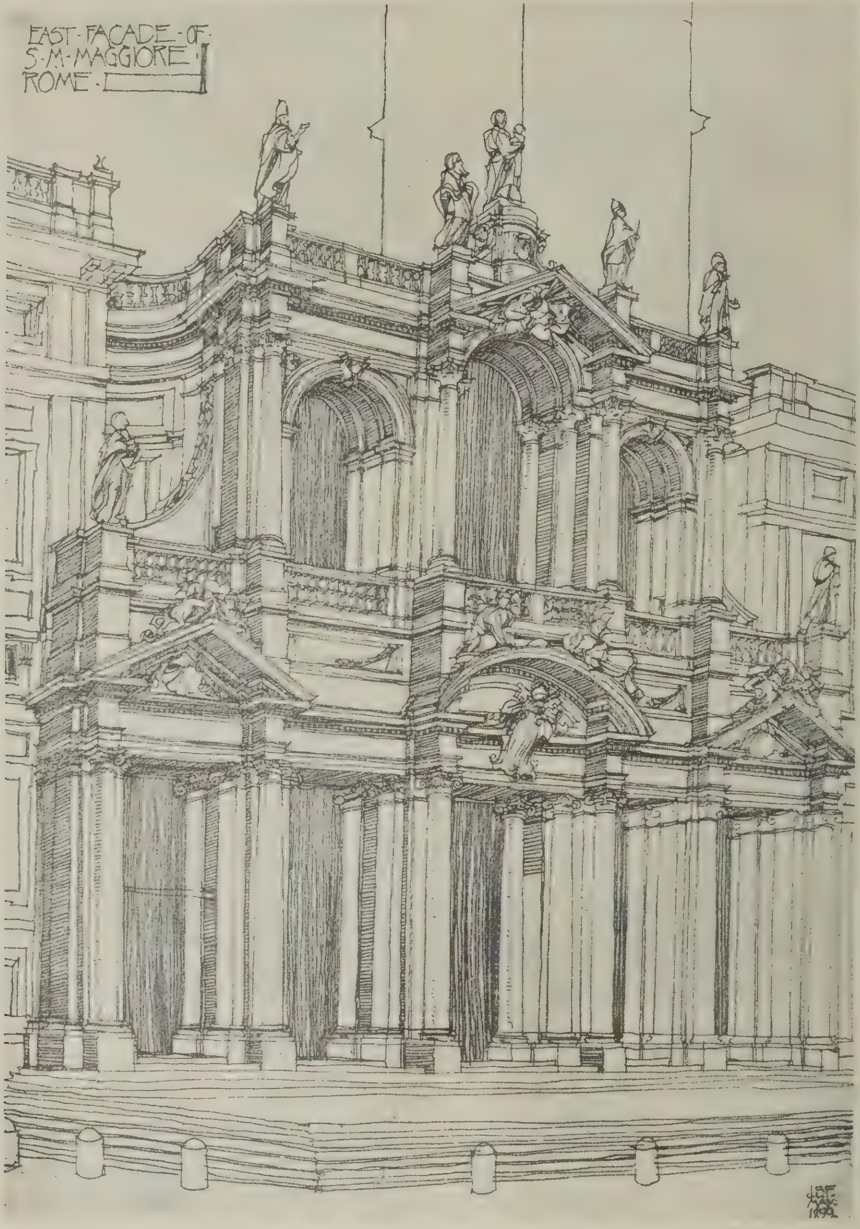
to be found in the cooling of theatres and public buildings; the storage of furs, rubber, hops, butter, fruit, and all sorts of perishable goods; the quick cooling of lard, and refining of whale oil; the chilling of chocolate, and the manufacture of optical lenses, essences, scents, margarine, sulphuric acid, &c. Even the corpses in the Morgue at Paris are now artificially refrigerated.

This list, though incomplete, is sufficient to show for what a number of different purposes refrigeration is used, and as most installations of any size involve either a totally new building, or structural alterations to one already in existence, the importance of the subject to the architect is manifest. He is frequently called upon not only to design buildings or extensions for cold storage and other purposes involving the use of refrigeration, but, in many cases, to specify the whole of the plant, including the refrigerating machine, motive power (gas, oil, steam, electric, or water, as the case may be), methods of cooling and form of insulation. A knowledge of refrigeration is therefore essential, in order that he may be able to arrange the plant and buildings to the best advantage, and, with this end in view, it is proposed in the present series of articles to deal with all branches of the subject which interest the architect, and show, as far as possible, the methods of design principally in vogue at the present day.

The principle of the refrigerating machine itself will be detailed at a later stage. At present, it will be sufficient to say that most modern machines work by the alternate condensing and vaporisation of a volatile vapour, such as ammonia, within a closed circuit. The evaporation of this vapour takes place usually in a system of piping from 50 feet to a few miles in length, which may be arranged in the form of flat or circular coils, or in single grids, the exact form varying with the purpose to which the plant is applied. In accordance with a well-known physical principle which may be exhibited by allowing some ether to evaporate in the palm of the hand, the act of vaporisation is accompanied by a large absorption of heat into the gas. This heat must be extracted from the metal of the coil itself and from its surroundings, with the result that anything in its neighbourhood, whether air or unfreezable brine, becomes intensely cold. The coil thus acts much in the same way as a block of ice, the difference being that the coils extract heat from everywhere near to change the substance within them from a liquid to a vapour, while the change in the case of ice is from the solid form to the liquid. The effect in both cases is the same, consisting in a considerable reduction in the temperature of surrounding objects, which, by the use of the evaporating coils, may, if necessary, be brought down to zero Fahrenheit or even lower. With ice alone they can never be reduced below the freezing point of water.

The arrangements of two small cold chambers, one cooled by ice and the other by "direct expansion" from a refrigerating machine to a temperature of about 38° Fahr., are contrasted in figures 1 and 2. Cooling by ice, it will be noticed, wastes a certain amount of space, which necessitates, for a given net capacity within the chamber, an increase in the radiating surface and the cost of insulation.

It is obvious that if either of these two chambers were constructed in the same way as an ordinary room, the difference in temperature between the inside of the walls and the outside would cause considerable leakage of heat, resulting in waste of ice in the one case, and loss of refrigerating effect in the other. To avoid this there are superimposed on the ordinary walls, floors, and ceilings, inner layers constructed of various non-conducting materials. Usually one kind of insulator only is used, but in some cases there are several thicknesses, each composed of a different material, with, very often, air spaces in between. The exact method employed depends on the purpose for which the cold store is to be used, and the opinions of the designer, but in all cases the end in view is to reduce both heat leakage and cost of construction to a minimum.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JBF 1909

Drawn by JAS. B. FULTON, A.R.I.B.A

In making a selection several points are to be considered. The material (or materials if more than one are used) should, as far as possible, combine efficiency with economy. It should also be fireproof, or at the least not easily combustible. Vermin should fight shy of it, it should have no tendency to absorb moisture, and it should not be liable to decompose or crumble to dust. No material complies exactly with all these conditions, but there are several which have been proved to fulfil the majority of them, and it will be as well, before proceeding to the actual design of cold stores, to become acquainted with the nature and properties of each individually.

### *Insulating Materials.*

*Silicate Cotton.*—Slag wool, or silicate cotton, is made by melting blast furnace slag at a temperature of about 3,000° Fahr., and driving through it a jet of superheated steam (in some cases compressed air). This treatment distends the slag to about twelve times its volume, and transforms it into a white fibrous substance, similar in some respects to spun glass. Its fibres, crossing and interlacing, entangle among themselves a vast number of tiny air cells, which, being individually non-conductors, give the material a high resistance to the passage of heat. The best wool is made from slag which is rich in silica and alumina, and poor in free lime. A certain amount of lime is beneficial and whitens the wool, but an excess causes it to become dusty and crumble after it is packed. Very white wool should therefore be looked upon with suspicion. The small globules of glass, which will be found suspended in the wool, also afford a good criterion of its efficiency. They are formed by the combination of the silica and lime in the slag, and although they must always be present in small quantities, the wool should be, as far as possible, free from them, as they reduce its insulating efficiency, and at the same time, by increasing the weight, lessen the covering power.

There is a very large demand for slag wool, as it is not only cheap, but efficient. It is also the only insulating material known which is absolutely fireproof. By reason of this property it has on many occasions been of the greatest service to the owners of cold stores, and some years ago a notable instance was furnished by a fire which took place at an Irish butter factory. The buildings were completely gutted, but the slag wool in the walls of the cold stores, which remained standing intact, although blackened by the heat, preserved the goods inside so well that the butter, it is rumoured, was sold in London at 55*s.* per cwt.

The one disadvantage it possesses is a slight tendency to absorb moisture by capillary attraction. The effect of this absorption, if it were allowed to proceed to the saturation point, would be very harmful, as it would reduce the insulating efficiency of the material by about 40 per cent., and probably

S. MARIA. DELLA PACE - ROME -
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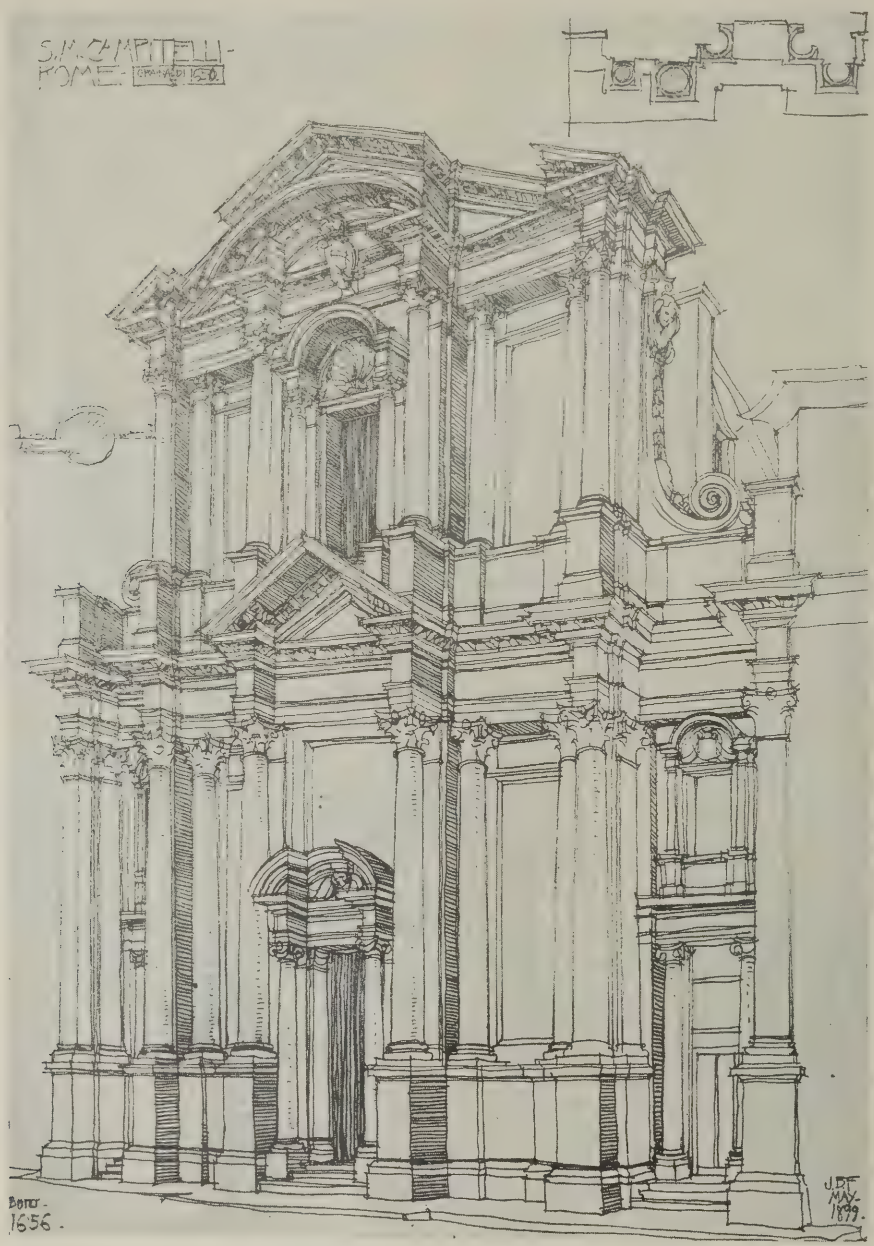
do serious injury to the timber by setting up decomposition. But by taking reasonable precautions and, in extreme cases, employing a lining of galvanised sheets, the possibility of dampness penetrating as far as the silicate can be effectually avoided.

In addition to the ordinary loose silicate, strips about 4 inches by 1 inch and ropes from 1 inch by 2 inches diameter may be obtained for the purpose of lagging brine pipes. It is also supplied in slabs, which may be backed with hair-felt or metal lathing, or bound on both sides with galvanised wire-netting. Its weight, when packed in the ordinary way, is 14 lb. per cubic foot, giving a covering capacity at 6 inches thickness of 320 feet super per ton, and the cost about 3*l.* per ton on rail.

*Cork.*—Cork is well known in various forms as the bark of a tree belonging to the oak family (*Quercus robur*), which flourishes in Spain and Portugal. It is claimed by those who manufacture it that it must naturally be the best of all insulators, because the tree which produces it grows in a country where it is very hot and where burning winds prevail. It follows, they say, that if the tree were not well insulated the sap would be dried up and absorbed and the tree would not live. Whatever modicum of truth may be in this, cork admittedly forms a very good insulating material owing to the myriads of tiny air-cells which are imprisoned throughout its structure, and which, as in the case of silicate, act individually as non-conductors. Although not absolutely fireproof, it is not easily combustible, and merely smoulders when exposed to great heat. It is also non-absorbent, and in this respect is superior to silicate. There is no capillary attraction caused by its honey-combed mass, hence if water leaks to the bottom of a cork wall it does not rise, and this makes it for some purposes very useful indeed.

For insulating purposes cork may be obtained either granulated or compressed into slabs. The granulated form is made from the waste cuttings produced in the manufacture of bottle corks, lifebelts, &c., which are ground up in an ordinary mill to separate the fibre from the bark and sifted to get rid of the dust. The larger grains are then packed and sold as granulated cork. Compressed cork slabs are formed from these grains by pressing them into iron moulds of the required thickness and baking at about 500° Fahr. At this temperature the cork gum liquefies and forms a natural binding, which keeps the blocks together when they are extracted from the moulds. The process is so regulated as to leave small spaces, which break the continuity of the material, and, assisted by the microscopic air-cells within the grains themselves, preserve its non-conducting properties. The same air spaces, of course, are formed by insulating with granulated cork in the ordinary way, but the grains, not being cemented together, are liable to settle, if subject to vibration, and cause a serious loss in insulating efficiency. The advantage of the slabs is that they



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are easy to handle and effect a certain saving in labour, as they simply require to be nailed in position. To facilitate this they are sometimes inset with wood. On the other hand, their density is about twice that of the loose granules, and this, combined with the extra cost of manufacture, makes the slabs rather expensive.

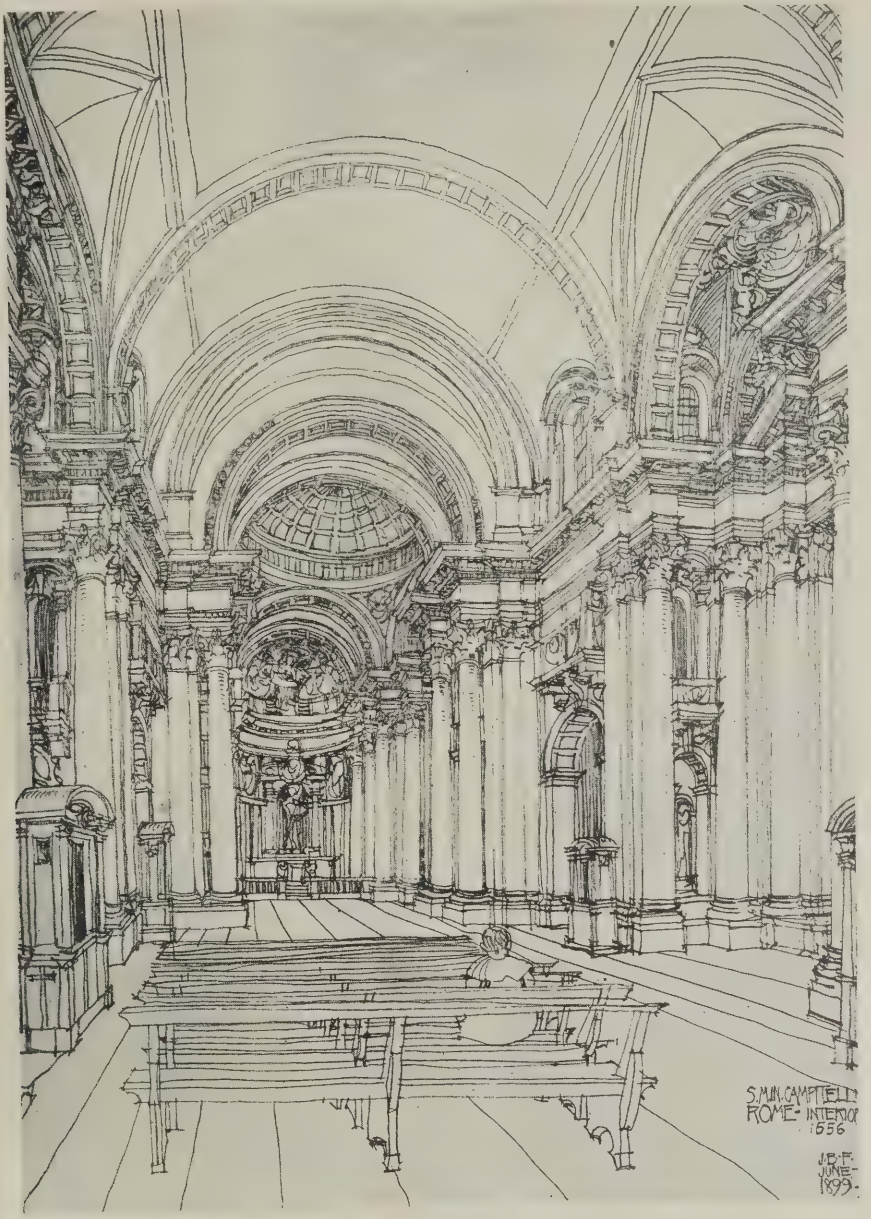
Granulated cork packs at 5 or 6 lb. to the cubic foot, and the slabs at 12 lb., giving a covering capacity in feet super per ton of 746 in the first case and 373 in the second, at a thickness of 6 inches. The cost of granulated cork is approximately 7*l.* 5*s.* per ton, and of cork slabs 3 inches thick 11¼*d.* per foot super, 1*s.* if inset with wood.

*Charcoal.*—Charcoal is more or less impure carbon. It is produced from bones, animals, and most vegetables, but the only kind which is useful for insulating purposes is that made from wood. The process of manufacture consists of burning the wood in closed retorts, oxygen being excluded and the temperature carefully regulated. Burnt in air, of course wood reduces to a white ash, but when taken from the retort about 65 per cent. is found to remain as carbon mixed with a certain amount of oxygen and hydrogen. The percentage of carbon depends on the temperature in the retorts. It is larger when the carbonisation is carried out at a great heat (*i.e.*, the charcoal is purer), but the quantity of charcoal obtained from a given quantity of wood is less.

To make good insulating charcoal only the lighter woods must be employed. One of the best of these is willow, and, in the form of turnings from the thread mills of Paisley, it is extensively used at the principal factory in this kingdom. It gives a light porous charcoal, which by reason of the air-cells entangled offers a high resistance to the passage of heat. That made from the heavier woods, such as box, is, on the contrary, more compressed and conducts both heat and electricity. It is therefore useless as far as insulation work is concerned.

The finished product may be obtained either in the flake form or as compressed slabs, somewhat similar to those made from granulated cork. The latter have been developed quite recently, and will probably be more expensive per foot super than the ordinary variety, as an extra process of manufacture is added, but, although no exact figures are available, comparative tests prove that they are superior in insulating efficiency. Their convenience has already been explained when dealing with compressed cork.

As an insulator charcoal has several advantages. Most chemical agencies have no effect on it, and it does not therefore tend to decay. It is also, owing to its powerful propensity for absorbing gases, very useful as a deodoriser. Further, when properly packed it is not liable to settle, but, if it should happen to do so, settles uniformly, leaving an open space at the top which can be easily refilled. This is important, as, when a material settles unevenly, blank patches are formed, which are difficult to locate and repair. Its one



Drawn by **Jas. B. Fulton, A.R.I.B.A**

drawback is that, being readily combustible in air, it is dangerous in the event of fire. There was even at one time a theory that it produced combustion in itself by spontaneous action, but this has been fairly well disproved and may safely be regarded as untenable.

Packed in the ordinary way charcoal weighs 12 lb. per cubic foot, and a ton at 6 inches thickness covers 373 square feet. The cost, which varies greatly, may be taken at 45*s.* to 70*s.* per ton.

Besides being employed for insulation, charcoal is also useful to the refrigerating engineer as a purifying and deodorising filter for distilled water in ice factories. A variety very suitable for this purpose is that made from sugar maple wood. *(To be continued.)*

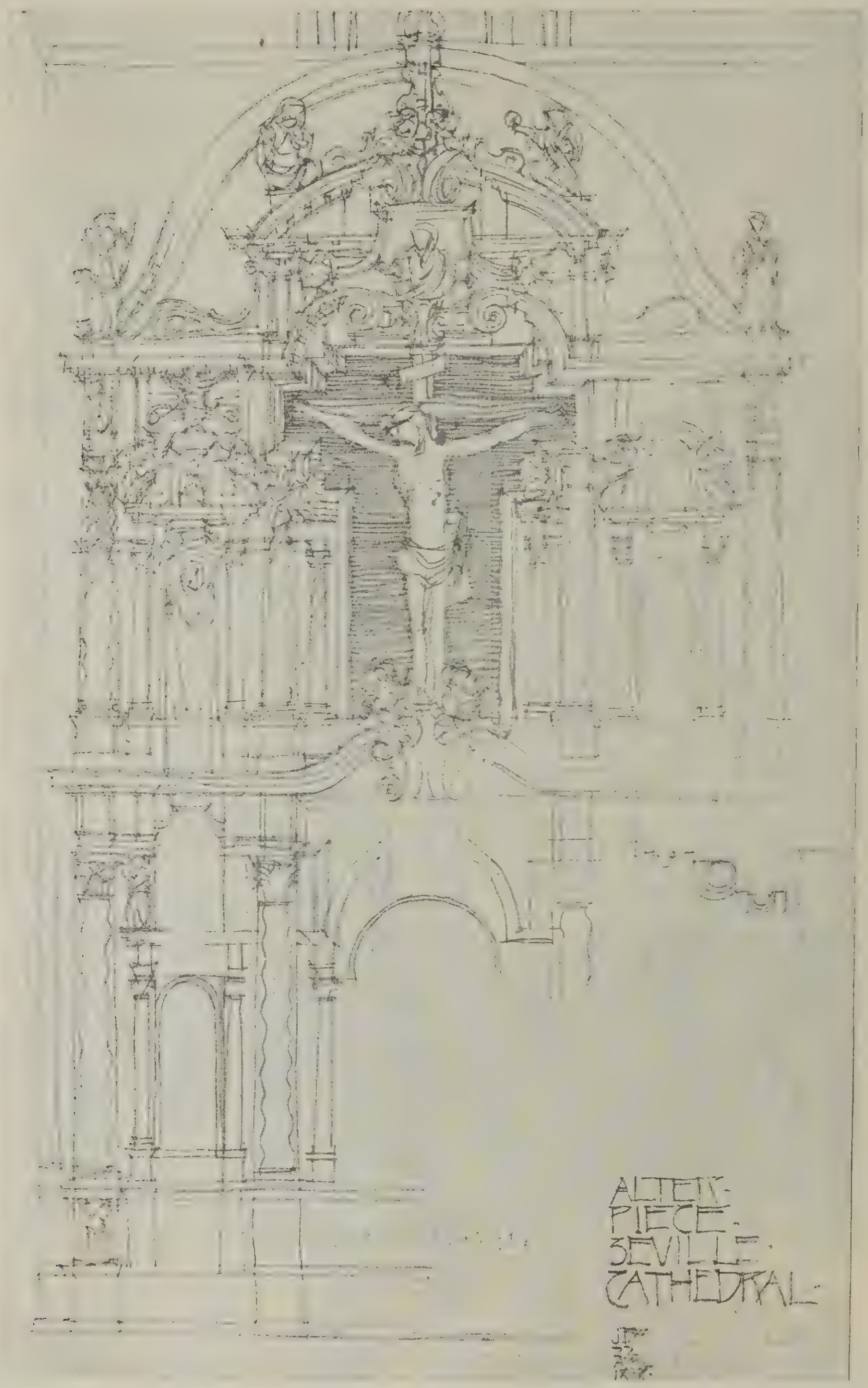
## RENAISSANCE ARCHITECTURE OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES IN ITALY AND SPAIN.

### ROME AND SEVILLE—A COMPARISON.

By J. B. Fulton, A.R.I.B.A.

THE glory of the Renaissance in Rome was full of the spirit of beauty, the proportion and refinement in detail of the Greeks, and the masterly conceptions and grandeur of the Romans. Rome was the centre of the highest civilisation in the world, and here the culture of the Renaissance discovered and studied the lost arts, the beauty of which inspired the genius of Bramante, Baldassare Peruzzi, Antonio da Sangallo, Michel Angelo, and many others. The personality of Michel Angelo so dazzled Rome by the splendour of his works that it is generally accepted by architects as the beginning of the decadent tendency in the Renaissance. Michel Angelo's influence is considered by many to be disastrous, but later historians will be able to write more clearly and be able to consider and compare more correctly.

Mr. W. J. Anderson, in his excellent book on the Renaissance in Italy, states:—"The loss of conformity to constructive principle was the decisive cause of the decay of Renaissance architecture, and if the responsibility can be attached to one man, that man was Michel Angelo, the greatest genius of all." And again he writes:—"The qualities in Michel Angelo's work which appear to have led architecture into the dark and devious ways of the Baroco corruption were: first and chiefly, its insincerity, in which may be included not only an absence of truthful construction or logical articulation, but the tendency to employ architectural features as mere scenery, and to introduce false or unnecessary windows, niches, panels, consoles, and balustrades,



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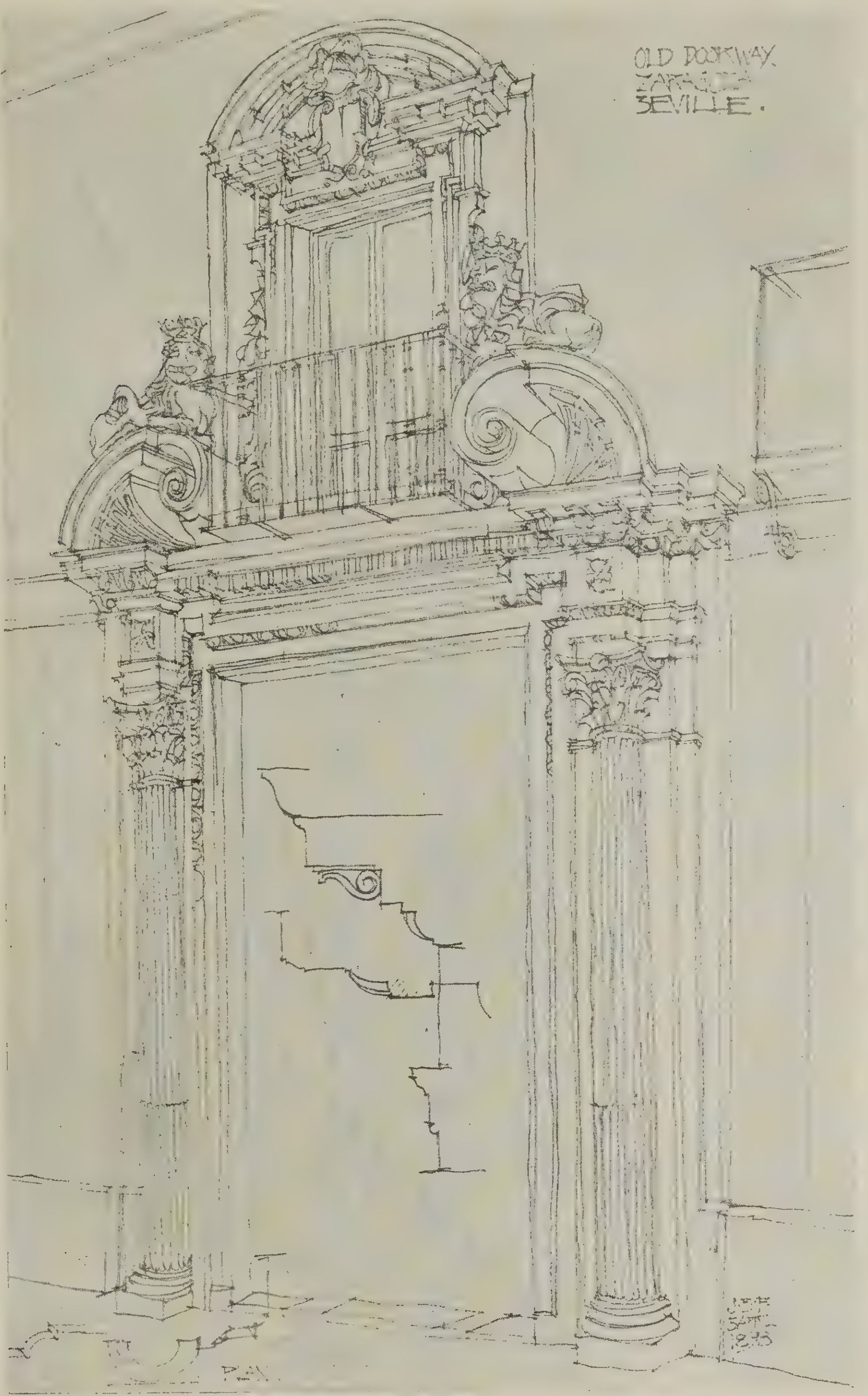
arising out of an unwholesome dread of unbroken wall surface; second, a quality which from its nature had less disastrous consequences, that of exaggerated scale." As a student in architecture I have learned that the above statements are wrong, and to learn this we have only to look at such noble examples as the Parthenon, the Banqueting House, Whitehall, &c. Michel Angelo had studied the ancient Roman buildings and had mastered the principles of construction and design. This knowledge, combined with that of sculpture and painting, gave birth to many wonderful examples in architecture which have inspired architects through centuries to the present day with imaginative suggestions in design. The object of this short paper is to trace this influence in later centuries in Rome and Seville.

The originators (some have stated) of the degenerated Renaissance known as Baroque were said to be Vignola, Carlo Maderno, Borromini, Carlo Fontana, &c. They are said to have robbed architecture of its fitting repose, and by the introduction of figures posed in startling attitudes, startled and convulsed by unseen agency, of curves instead of straight lines, of order above order, substituted a turbulent unrest. Not that the style was without striking, imaginative, and artistic effect.

An undoubted vigour in the disposition of detail, a feeling for vastness and pomp, together with an internal decoration which spared neither colour nor costly material to attain an effect of dazzling splendour, such are the distinguishing features of the later Renaissance. In Rome and Seville examples are seen on every hand—in the churches of St. Ignazio, Gesu, St. Andrea della Valle, the Bernini Palace, &c., in Rome; and in Seville, the Cathedral, Archbishop's Palace, &c.

The first example I choose is the church of St. Maria Maggiore at Rome, designed by Fuga in 1743. The view on p. 16 shows the east portico, which opens in five



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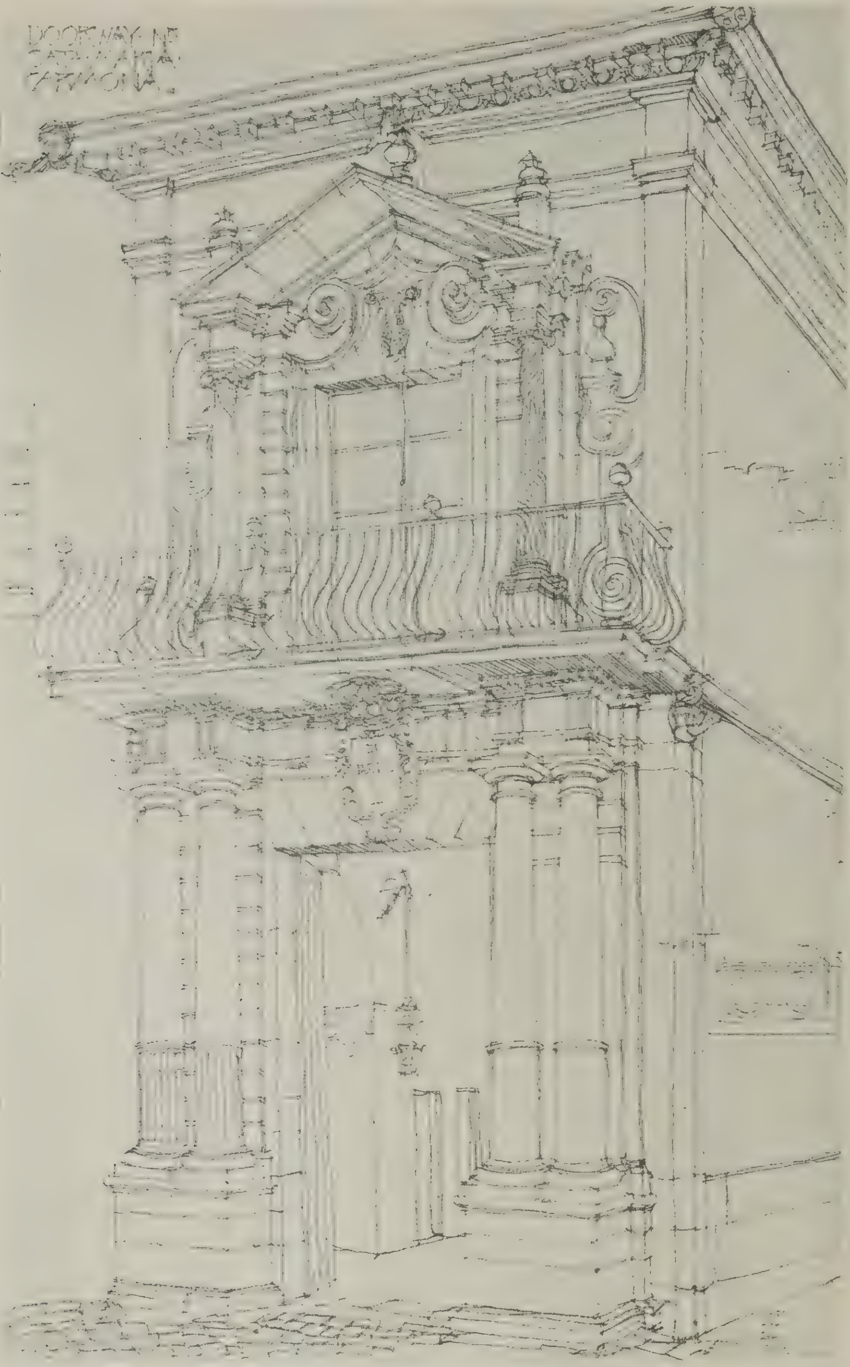
portals with a loggia over in three arches. The façade as a whole is masterly, with the portico in the centre, suggesting the approach to a great building, spacious, magnificent, and picturesque in treatment. The openings forming the portals are all square, the entablature of the Ionic order being carried through, with the central and side openings specially emphasised with pediments suggesting the Trinity; and not only do the pediments protect sculpture but they also support sculpture, the central opening being more elaborate. A loggia being required over to protect some ancient mosaics, three arches were formed in a Corinthian order, the central arch being carried higher under a pediment, in contrast to the semi-circular pediment immediately below, over the square portal. The end piers are crowned with statues on the lower order; an enriched cavetto buttress carries the composition back on the upper order to the second pier on either side. The junction with the main building at this point is worthy of note, as on plan the wall forms a large cavetto. One of the most interesting and important points to note is that every feature is perfect in itself, and yet the composition as a whole is consistent and logical, and clearly shows the result of a cultured mind carrying forward the traditions of the Renaissance in a most interesting manner. My next example is the church and square of St. Maria della Pace (p. 17). A short street leads on an axial line to the circular portico forming the principal entrance to the church. The square is quite small, and one is only a few yards from the building when the originality and beauty of conception awakens the imaginative spirit of architecture. The perspective is slightly exaggerated to show more clearly this marvellous example. A Doric order forms the lower storey; the entablature is unbroken except on plan; a semi-circular porch suggests the principal entrance, and is a pleasing contrast to the reversed curves of the upper storey forming an architectural background, and to the angle pediment crowning the central feature. The upper storey is the Composite order, treated in plan in a most original manner, and yet

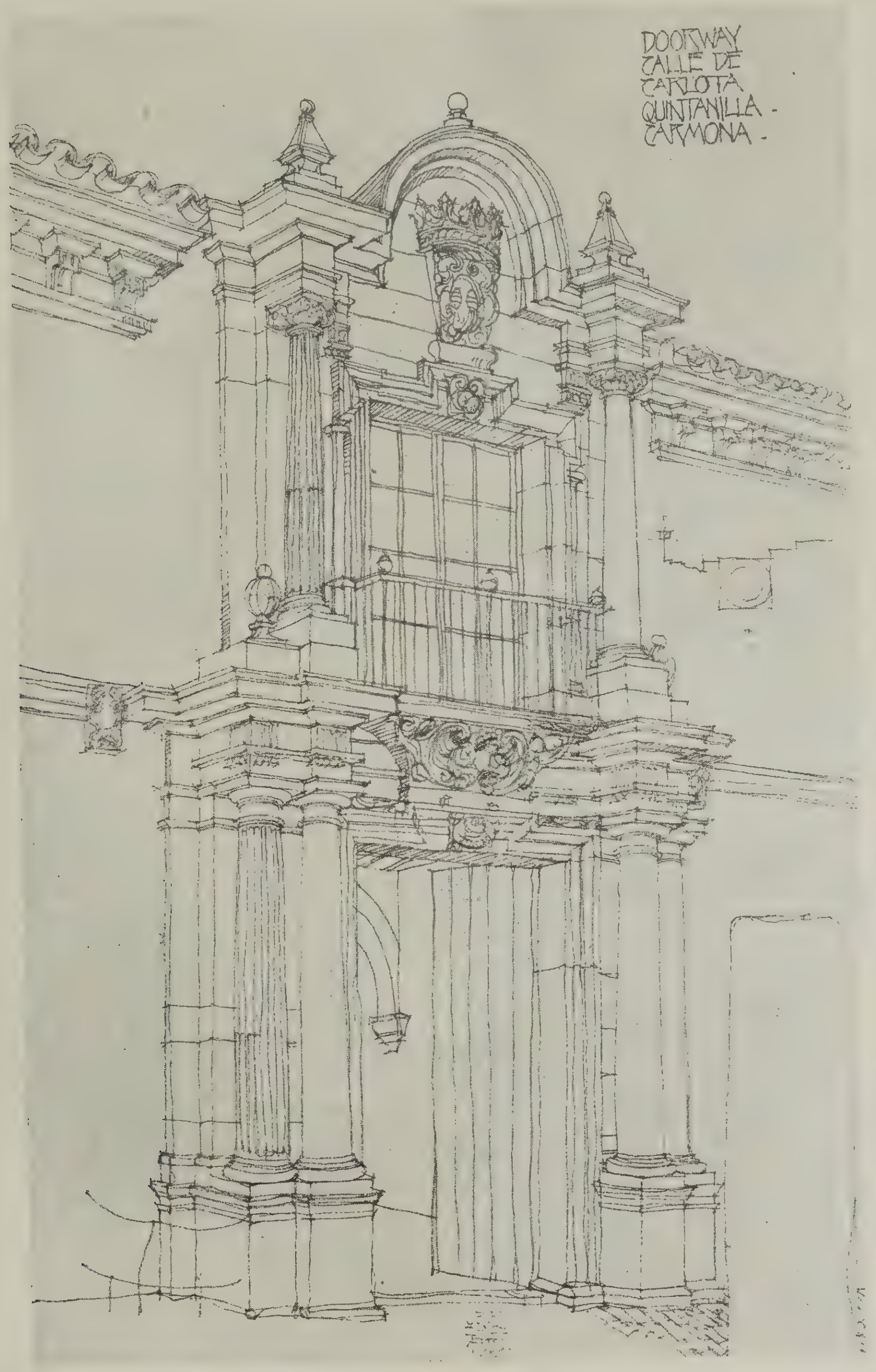


Drawn by **Jas. B. Fulton**, A.R.I.B.A.

with all the curves and recesses the spirit of the Renaissance is clearly shown. Your interest is held at every part, and finally rests with pleasure on the central panel, with coat of arms, emphasised and protected by a semi-circular pediment.

The church of St. Maria in Campitelli, erected by C. Rainaldi under Alexander VII., is the next example. The lower storey is Corinthian, with a pedestal base. The central doorway is emphasised with a broken semi-circular pediment, which is again framed with the true central columns of the order and crowned with an angle pediment. It is interesting to note that the order of the doorways is Ionic and rises from the base of the pedestal. The upper storey is Composite, and is contracted to the three central bays of the lower order by voluted, carved buttress features. The window, with its smaller order and semi-circular pediment, groups with the larger pediment over; and both are contrasted with the broken pediment crowning the composition. This is a work of extraordinary power, showing a masterly grasp of the principles of architecture, and revealing a charm and freedom in design that the Greeks and Romans suggested but never attained. The interior of this church is remarkably fine, and forms the subject of the next example. The interior is designed in a masterly style in the Corinthian order. The nave, with its barrel vaulted ceiling and side chapels, leads in the usual manner to the transepts, where the crossing is crowned with a dome with enriched pendentives, and further is the semi-circular apse for the high altar. The general effect of the Corinthian order without a pedestal base is exceedingly charming, and breathes the life and spirit of the highest aspirations of Classic genius.

The Renaissance in Spain is in many ways a contrast to the Renaissance in Italy, especially the architecture during the sixteenth century; for example, the Town Hall in Seville by Diego de Riano, 1530, &c. Nowhere in Spain are found examples showing the refinement, knowledge, and beauty of those in Italy; but there are to be found everywhere in Spain works of architecture

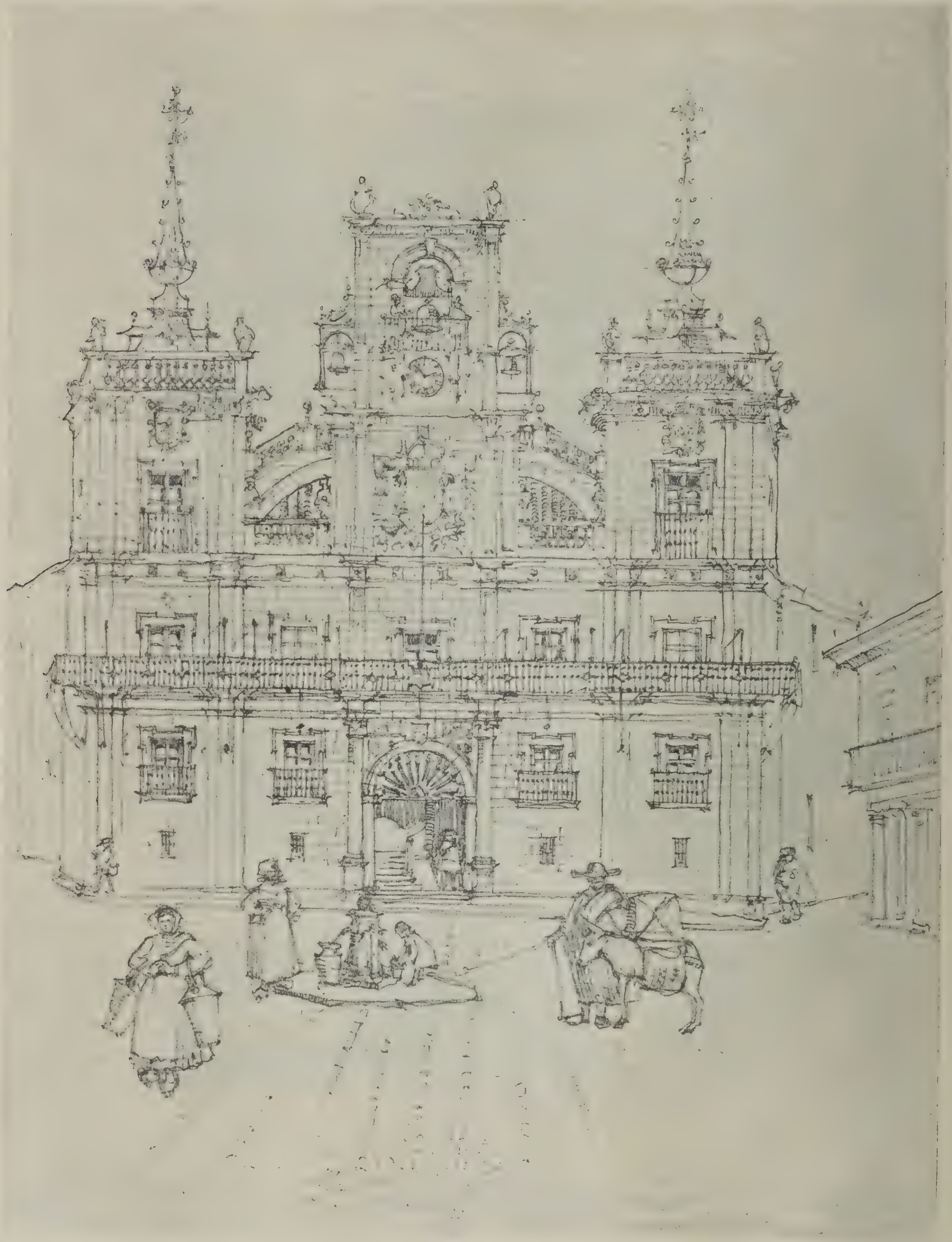


Drawn by JAS. B. FULTON, A.R.I.B.A.

which are full of suggestive forms and ideas, more picturesque perhaps although not so refined. Many buildings of the Plateresque or Early Renaissance are familiar to the student, but later examples have not yet been studied; and I propose here to describe several in contrast to the Roman examples.

My first sketch is an altar piece in the Capella de la Concepçion Grande in Seville Cathedral. The treatment is most original and effective. The general build-up of the composition is good, with ordinary niches on either side and voluted cornices with angels on pediments, whilst the interest of the design is undoubtedly centred on the Cross, with its masterly recess, crowned with voluted and semi-circular pediments. The treatment and effect is grand and mysterious, especially in the dimly lighted interior of the great church.

Many of the houses in Seville have interesting doorways, and I choose one for my next example—a fine Corinthian order with half columns in plan, with door architrave and small projecting pilasters on either side. The architrave of the doorway runs up to the under side of cornice, and has no connection with the architrave of the entablature. The pediment is broken and voluted supporting lions, with a small window between crowned with a semi-circular pediment protecting a shield. The simple recessed surface at either side is effective, and with the balcony and other features forms a composition at once original and pleasing, because the design is based on the traditions of the Renaissance. This doorway clearly shows the influence of MICHEL ANGELO in Spain, although lacking in his masterly knowledge of sculpture in detail. For the next two examples we go to Carmona, near Seville—the façade of a house or hostel near the church of Santa Maria. The lower order is Doric, on a pedestal with columns fluted one-third up. It is interesting to the student to note the treatment of simple channelling on an unbroken surface behind the columns, and the simple treatment of doorway. The upper mem-

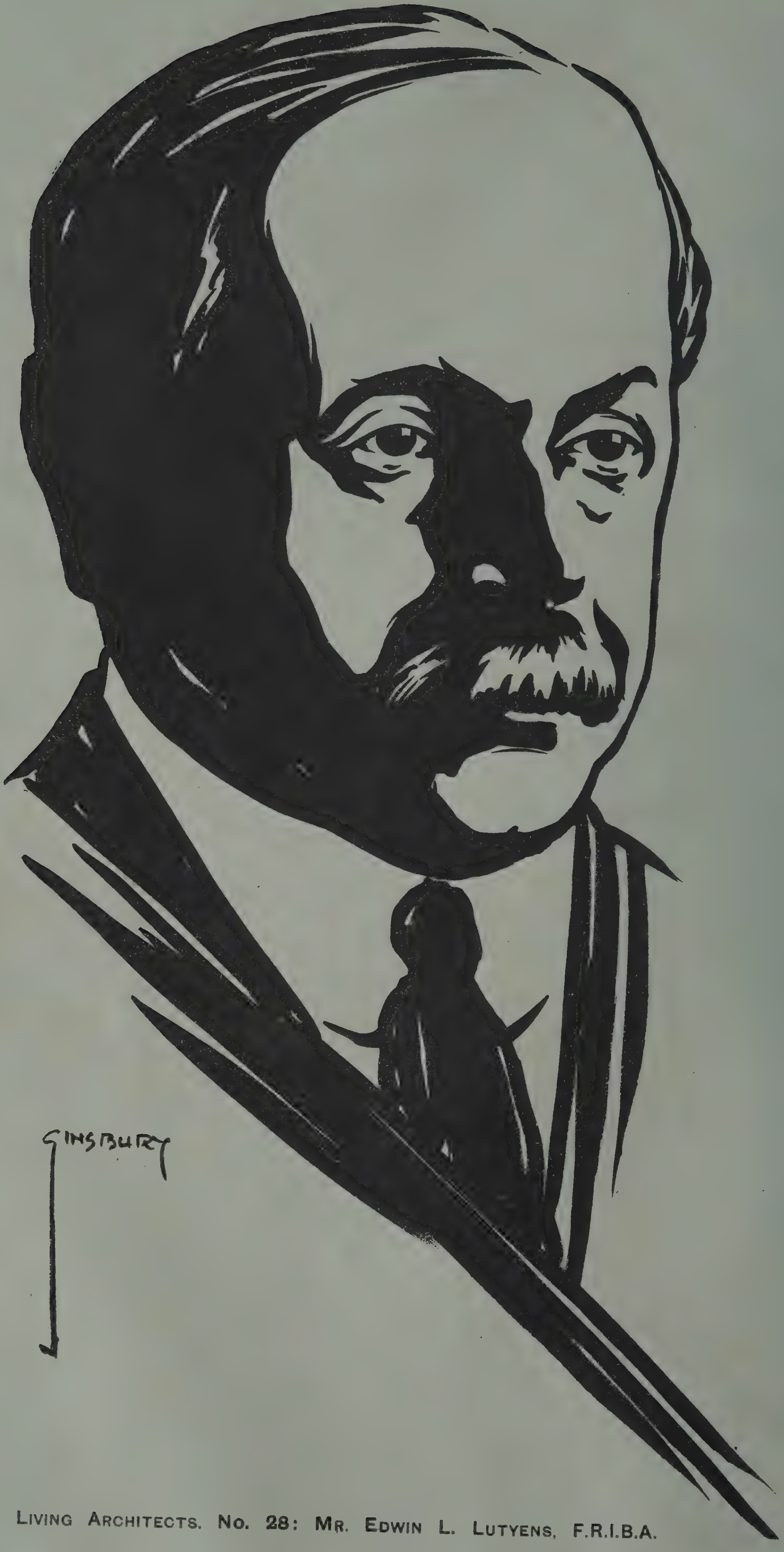


THE TOWN HALL, ASTORGA.—Drawn by LESLIE WILKINSON, A.R.I.B.A.

bers of the cornice support and form the balcony over. The upper storey is Ionic with angle pediment over. The voluted ornament is curious, but not in good taste. The manner in which the crowning cornice of the building is kept strong and unbroken binds the composition and gives the whole a masterly touch.

My last example, the doorway in the Calle de Carlotta Quintanilla, is somewhat similar at the first glance, but in detail it differs very considerably; note the treatment of balcony with the semi-circular pediment over crowning the whole composition. The method of building up from the two columns forming the lower storey to the one column over is suggestive and picturesque.

In all the towns of Spain the student will find many more examples; enough has been shown, I hope, to prove that the Renaissance lived and flourished in the seventeenth and eighteenth centuries. In Italy the Renaissance may be studied for its perfection in composition of design and beauty of detail, while the Renaissance in Spain may be studied for its suggestiveness and imaginativeness, assisting to a higher and nobler architecture.



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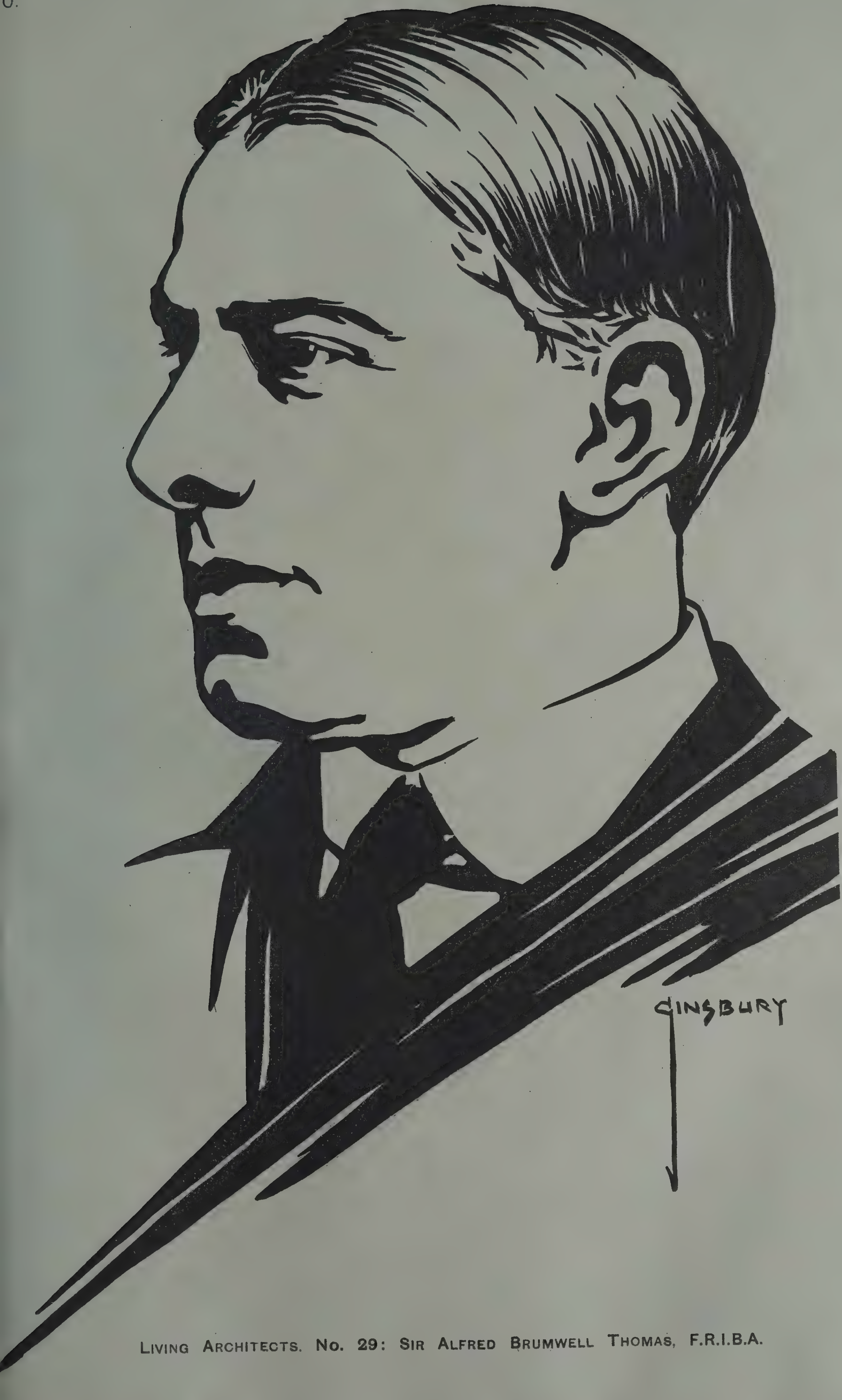

LIVING ARCHITECTS. No. 29: SIR ALFRED BRUMWELL THOMAS, F.R.I.B.A.

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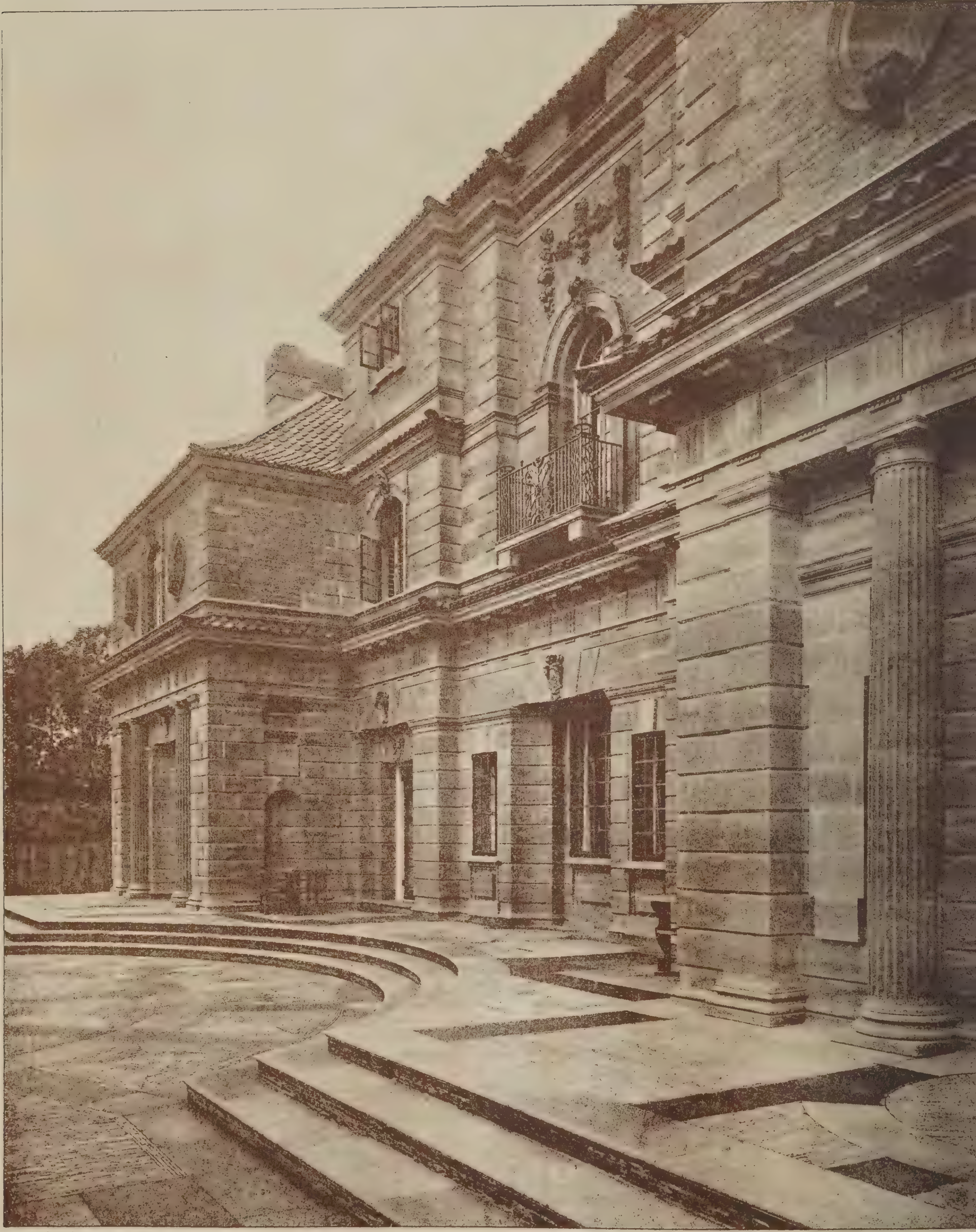

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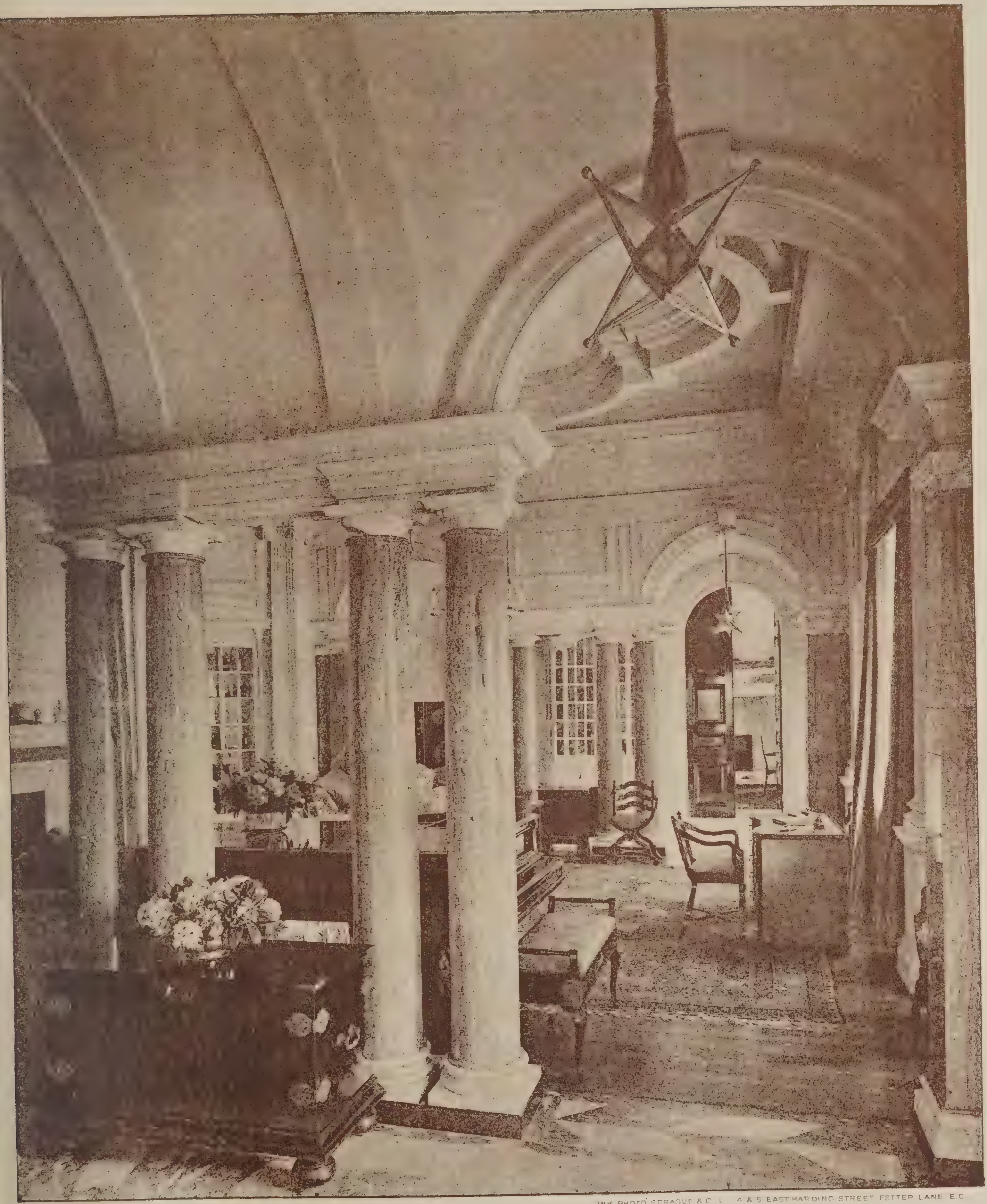

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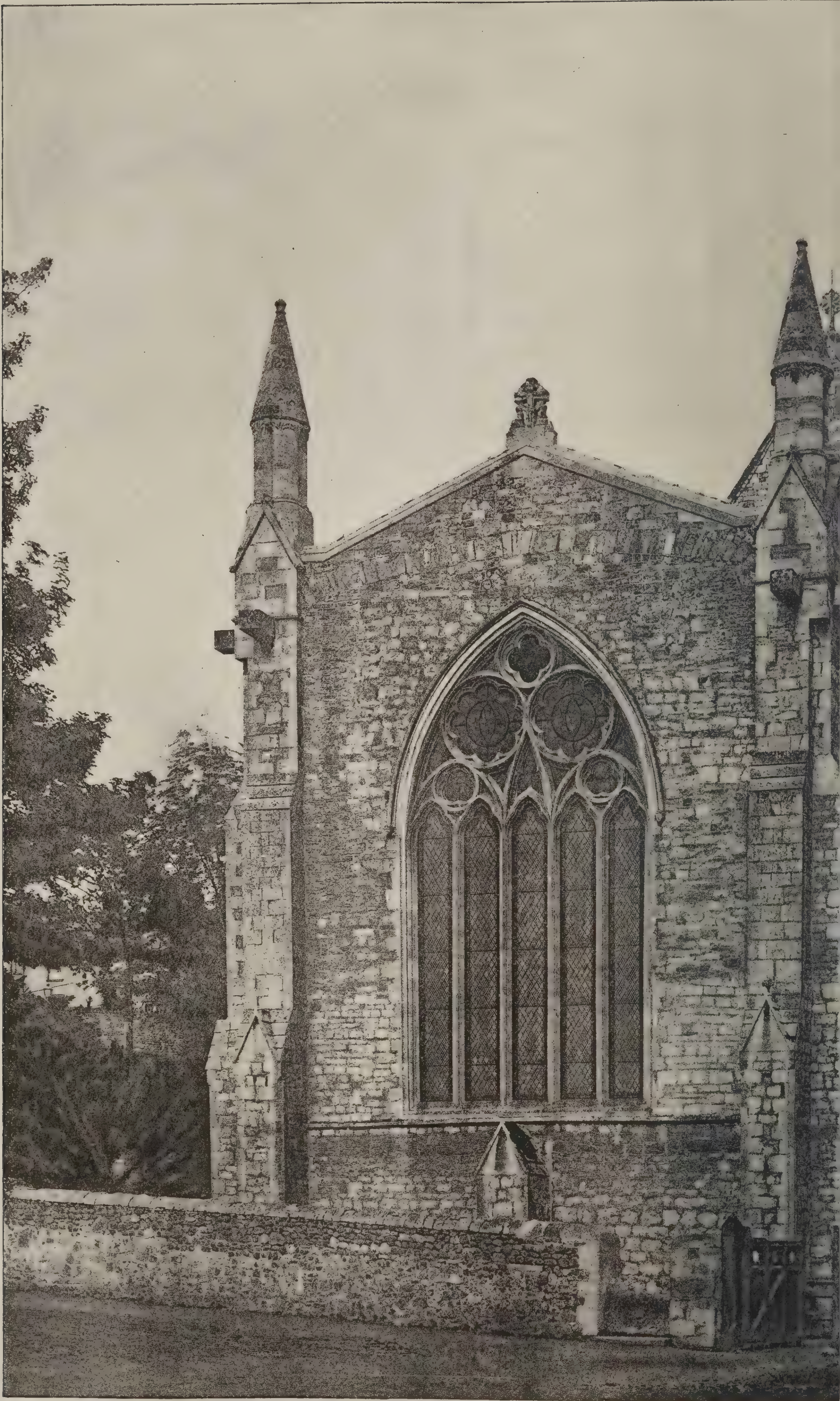

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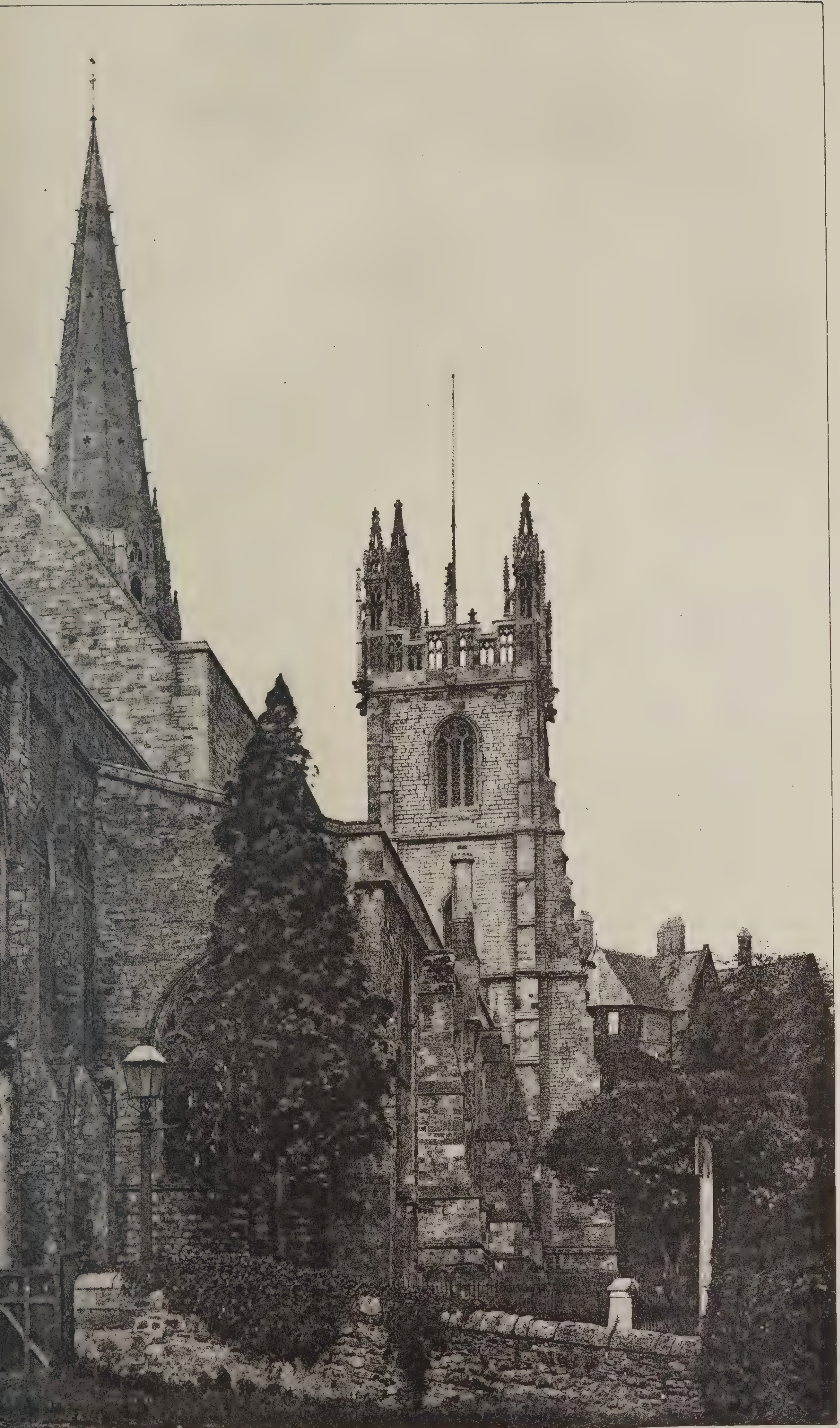

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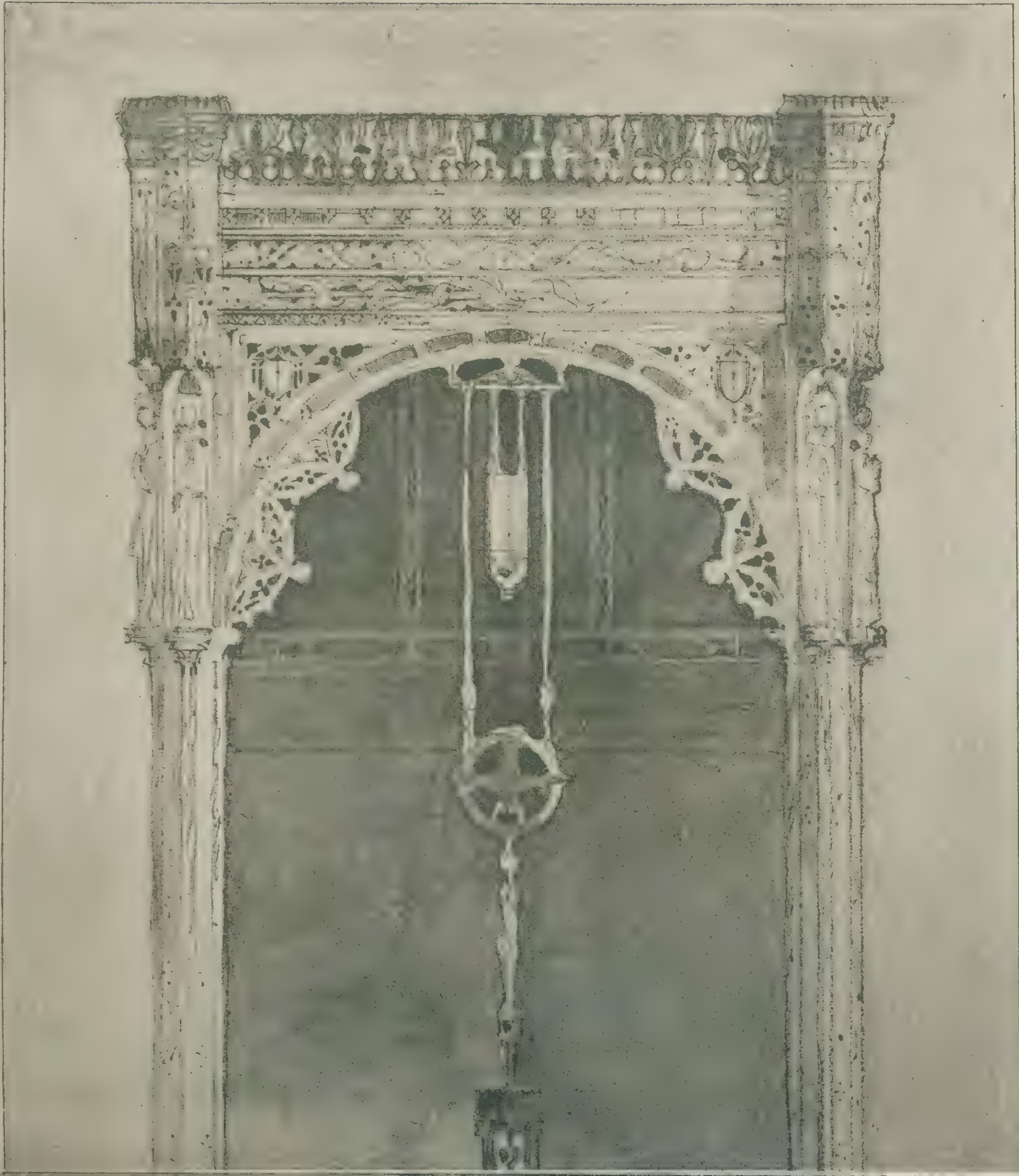
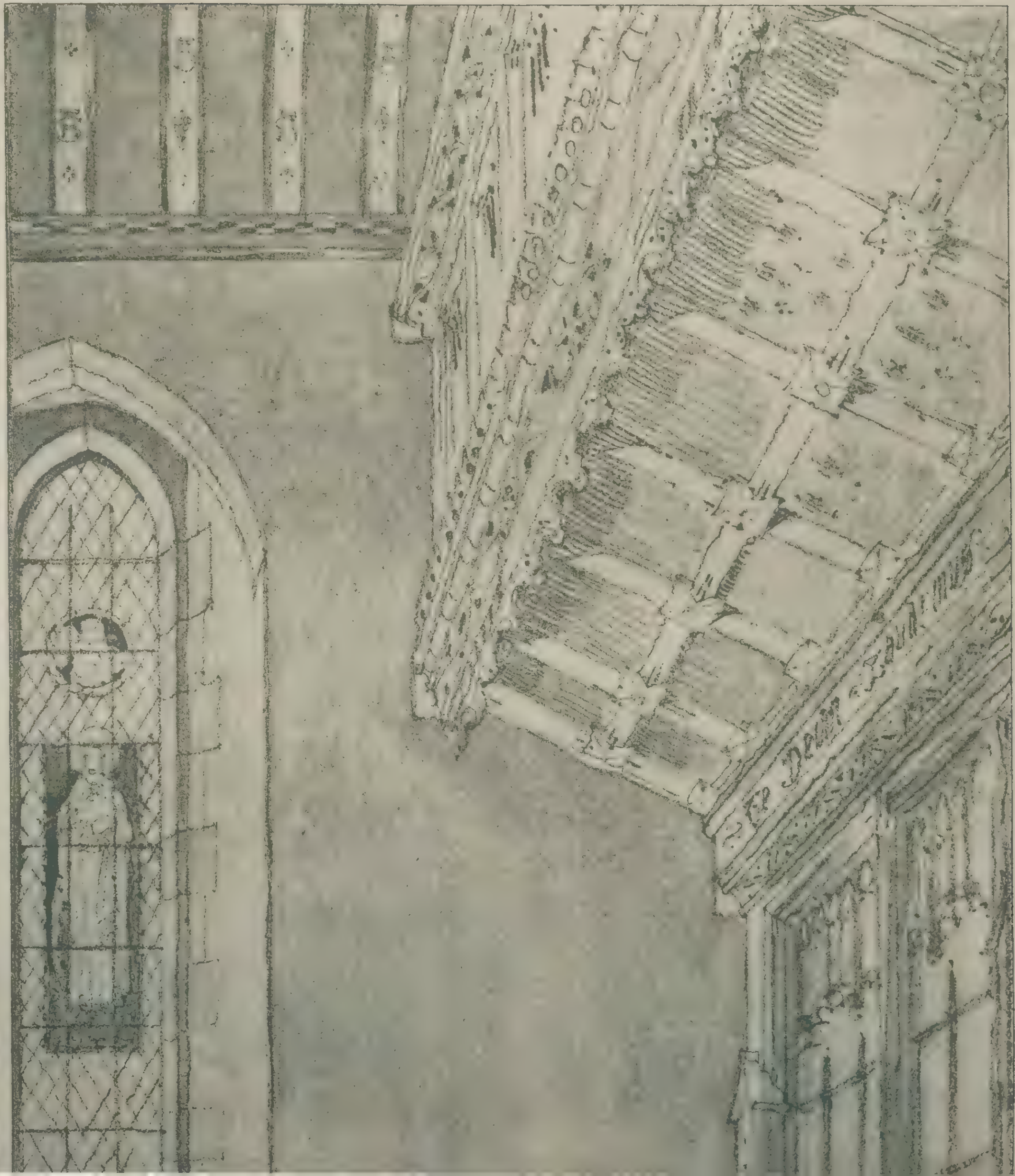
FF: East End of Lady Chapel.

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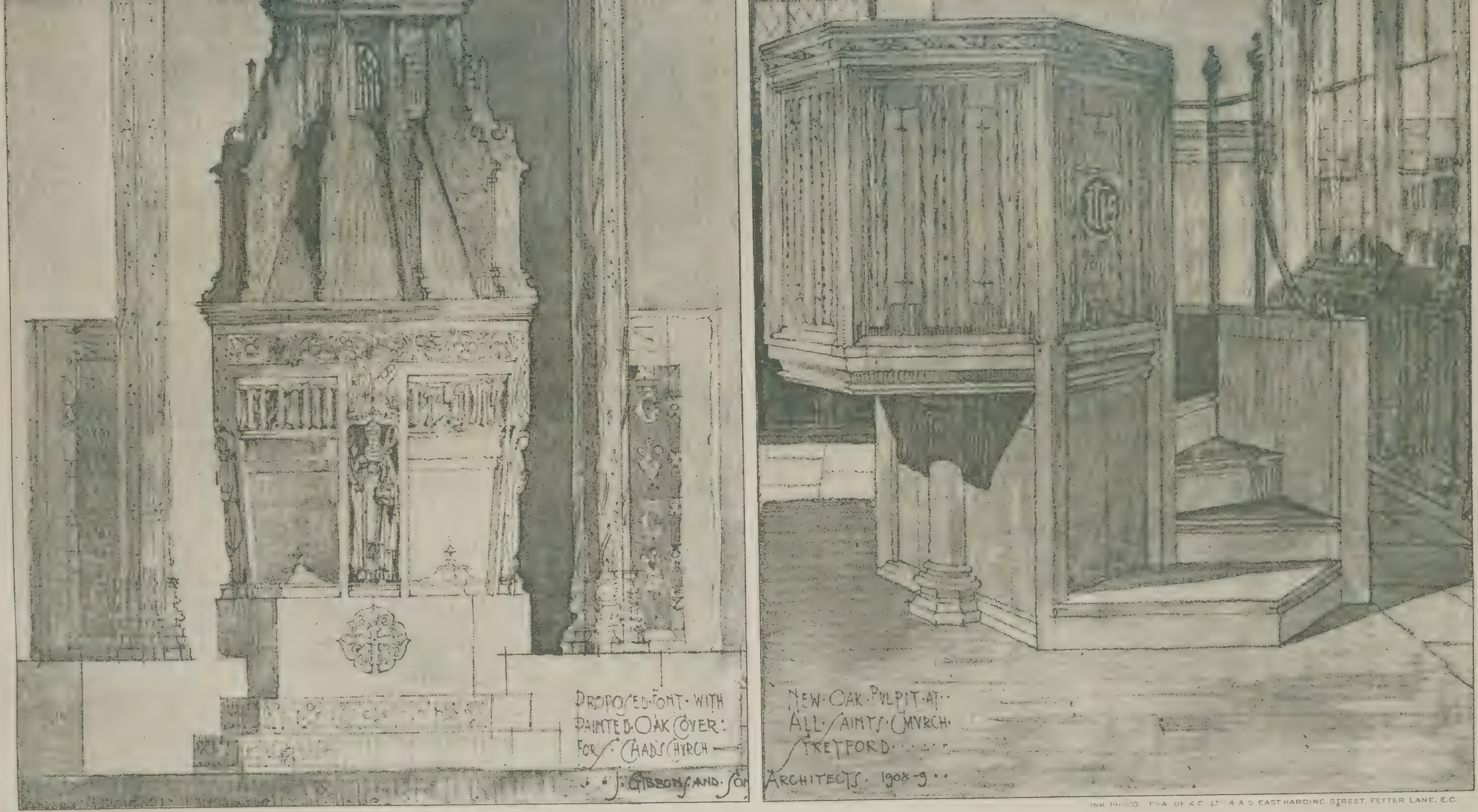

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*Royal Academy Exhibition, 1909.*

DESIGNS FOR CHURCH FITTINGS

Messrs. J. GIBBONS & SON, Architects.

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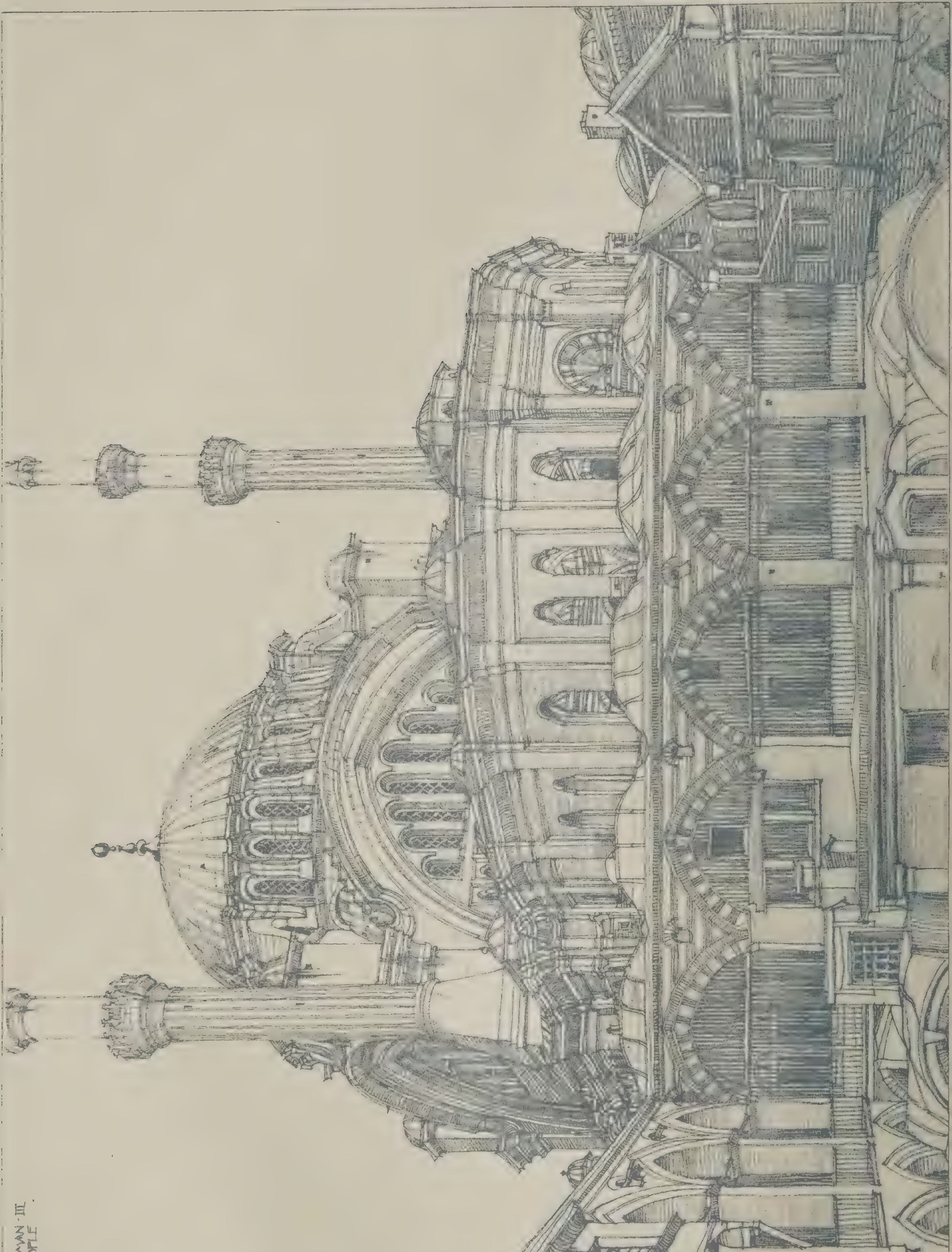
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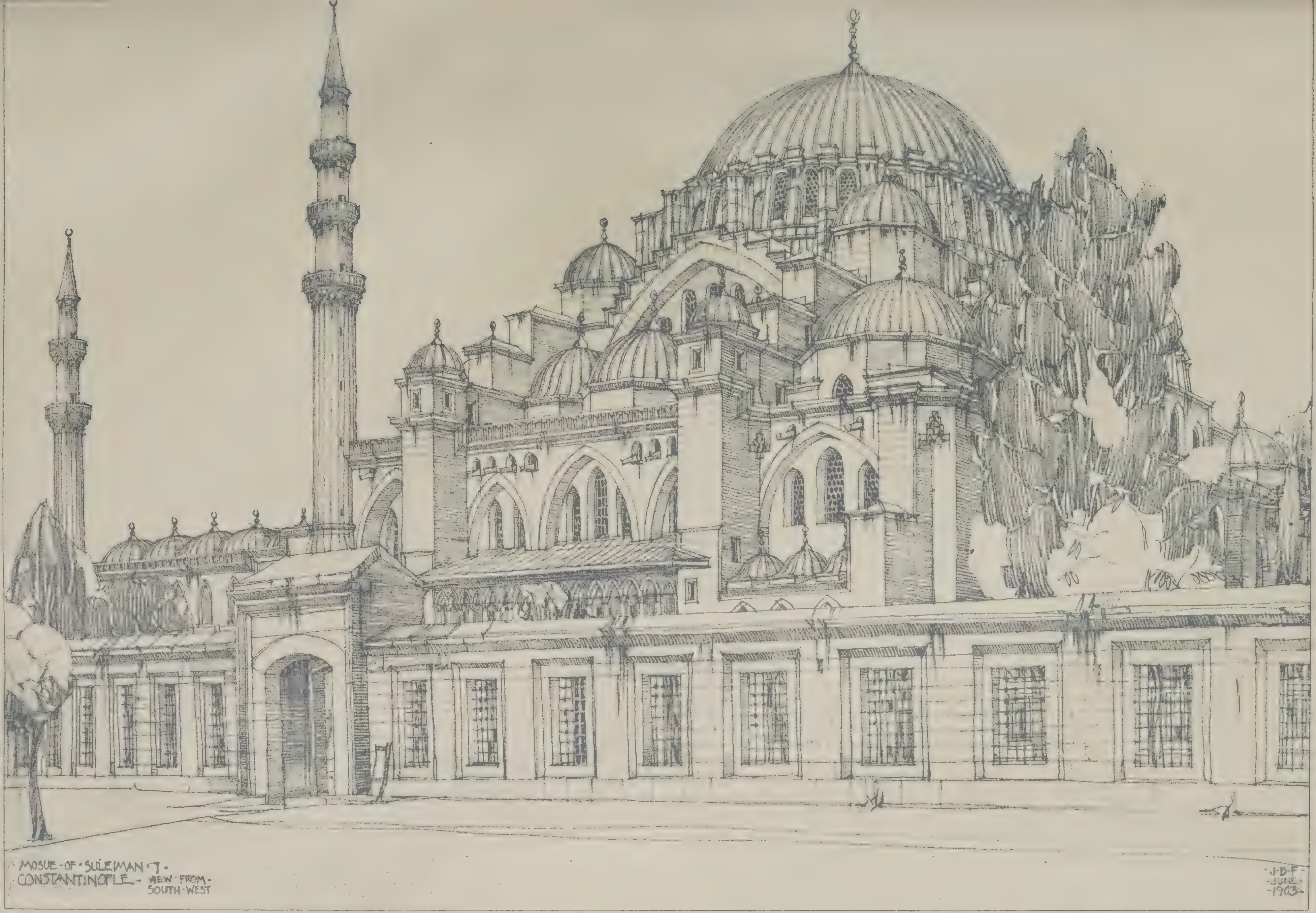

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MOSQUE OF SULEIMAN I., CONSTANTINOPLE: VIEW FROM SOUTH-WEST.

From a Drawing by J. B. FULTON, A.R.I.B.A.

UNIVERSITY OF ILLINOIS

# The Architect.

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## FORTHCOMING EVENTS.

*Friday, January* 14.

Architectural Association: Paper on "A Comparison between English and Continental Ironwork," by Mr. J. Starkie Gardner.

*Monday, January* 17.

Royal Institute of British Architects: Paper on "Carr of York," by S. D. Kitson, F.R.I.B.A., M.A. Award of Prizes and Studentships.

Royal Academy: Course of Four Lectures on Painting, by Sir W. B. Richmond, R.A., K.C.B.; (2) "Design and Drawing."

Royal Society of Arts: Cantor Lecture (1) "Textile Ornamentation," by Mr. Alan S. Cole, C.B.

*Tuesday, January* 18.

Royal Institute of British Architects: Annual Exhibition of Designs and Drawings submitted for the Institute Prizes and Studentships 1909-10 opens in the Gallery of the Alpine Club: closes January 29.

*Wednesday, January* 19.

Edinburgh Architectural Association: Paper on "Architectural Form Uninfluenced by Material: A Popular Notion to the Contrary Reviewed," by Mr. Alex. M'Gibbon, A.R.I.B.A.

*Thursday, January* 20.

Royal Institution of Great Britain: Paper on "Assyriology" (1), by the Rev. C. H. W. Johns, M.A.

Concrete Institute: Paper on "Reinforced Concrete Chimney Construction," by Mr. E. R. Mathews.

## COMPETITION DESIGNS FOR THE CITY OF LEEDS TRAINING COLLEGE.

THE competition for the proposed City of Leeds Training College for Teachers, to be erected at Kirkstall Grange, Far Headingley, is notable in several ways. First, it was limited to architects practising in Leeds, and though limitation by geographical considerations is not now peculiar or unusual, there are circumstances connected with this Leeds competition that we think must be unique.

In the city of Leeds the Education Department, like others, has an official and permanent architect and staff, and as the upshot of the competition proves, a competent architect, specially skilled in the planning of school buildings. Now the architects practising in Leeds necessarily, as ratepayers, assist in the payment of the official architect's salary, and might naturally and justifiably feel aggrieved that one or some of them should not be employed when the city of Leeds erects an important and costly building.

The Leeds Education Committee promoted a competition, limited, as we have said, to their fellow-townsmen, but with some remarkable peculiarities. They determined that the competition should not result in the success of one architect only, but that four or five should share the work of designing and carrying out the college. This is rendered feasible by the fact that the training college is to consist of several blocks of buildings—an educational block, seven hostels, and other separate buildings. Instead of premiums, therefore, the prizes consist of jobs, the author of the best design getting the biggest one and four others getting smaller ones. We are a little puzzled to know how the four smaller ones are to be divided, as, according to the award of Sir Aston Webb, the assessor, which has been adopted in its entirety by the Leeds City Council, there are seven hostels to be built from the designs and under the supervision of five different architects. The architect of the big job is to have a "general control over the design" of the hostels he does not himself design, so that it looks as if the college were to be the work of a syndicate with a chairman entrusted with exceptional and disciplinary powers. We hope there is enough tact and *camaraderie* amongst the selected architects to ensure the work being carried to a satisfactory conclusion, but it is evident that the experiment is a bold one and contains the ingredients of a very pretty kettle of fish.

The next point to notice about this remarkable competition is that the competitors were supplied with "plans, showing a detailed arrangement of the educational block and of the hostel blocks which have met with the approval of the Board of Education," prepared by the official architect, Mr. Fred Broadbent. Competitors were at liberty to depart from or vary these as they pleased, but it is a tribute to their excellence that very few ventured to make more than trifling alterations, and of these only one was amongst the five selected by Sir Aston Webb, and that, we imagine, rather in spite of than in consequence of the departure from the approved plans.

Competitors were not required to show plans of the hostels nor any indication of their elevations other than could be expressed in a small-scale bird's-eye view, so that the competition virtually resolved itself into one for the elevations of the educational block and the general lay-out of the estate of forty acres with the various buildings. Thus the ratepaying architects of Leeds who competed may consider that they had a good deal of their work done for them by their employé, the official architect.

The site of the college is an excellent one, ample in extent, well sheltered on the north and south-west by woods and open to the south, whilst Kirkstall Grange, the former residence of Lord Grimthorpe, is an old house of considerable dignity and architectural interest, and is to be retained as a hostel in addition to the seven new ones.

The arrangement of the blocks which best seemed to solve the problem was that of a quadrangle open to the south with the educational block on the north, the men's hostels on the west, and the women's hostels in double file on the east. Mr. Kirk's disposition was a charming variant with three of the women's hostels forming a separate group on the west of the great open quadrangle. Mr. Schofield had another plan with three of the women's hostels *en échelon* behind and northward of the educational block, thus gaining symmetry.

As regards the design of the elevations, Mr. Atkinson, Mr. Kirk, and Mr. Kitson all gave refined and scholarly versions of English Renaissance based closely on eighteenth century work and thus harmonising with the design of the old mansion. Mr. Schofield's treatment was rather more of the modern twentieth century version of Renaissance to which we are now accustomed in competitions for municipal buildings, and Messrs. Percy Robinson and W. Alban Jones also gave a modern design, piquant and pleasing, if less dignified and restful than that of the other selected architects.

There were amongst the unfortunates several good designs both in elevational treatment and grouping. Of these we liked best that of Mr. Wm. Whitehead, a good scheme shown in a most excellent coloured picture.

Drawn by Banister F. Fletcher, F.R.I.B.A.

The architect placed first by Sir Aston Webb is Mr. G. W. Atkinson; the author of design No. 4 is Mr. Albert E. Kirk, A.R.I.B.A.; of No. 13, Mr. Sydney D. Kitson, M.A., F.R.I.B.A.; of No. 14, Mr. W. Peel Schofield, A.R.I.B.A.; of No. 26, Messrs. Percy Robinson, F.R.I.B.A., and W. Alban Jones.

The following is Sir Aston Webb's report on the competition:—

"I have made a careful examination of the twenty-seven designs sent in in competition for this building, and must congratulate the committee on the excellent response made to their invitation. The designs show much care and thought, together with a due regard for practical requirements and the conditions laid down.

"I have no hesitation in reporting that, in my opinion, taking plan and elevation together and the general requirements of the scheme, that the design numbered 9 is decidedly the best, and I therefore recommend that the author of this design be appointed architect for the college, subject to his being able to obtain a satisfactory tender for the erection of this design within the usual margin of 10 per cent. of his estimate. Of the remaining designs I consider the authors of Nos. 4, 13, 14, and 26 would be the most suitable for selection as architects for the hostels, but I should recommend that the author of No. 9 be entrusted with the erection of the southernmost block of hostels and that he be given a general control over the design of the remaining hostels, so as to ensure a general unity to the whole scheme."

## NOTES AND COMMENTS.

The exhibition of the Arts and Crafts Society that has just been opened at the New Gallery, Regent Street, is the last that will be found in its old home, for that gallery will shortly change its function as the scene of art exhibitions for the more mundane purpose of prandial delights. Space does not allow us at present to give a critical review of this the ninth exhibition of the Arts and Crafts Society, but the furniture, metal work, pottery, and bookbinding now to be seen are, as before, admirable and well worthy of a visit from all who believe, as we do, that Art is not confined to picture painting in oils, or even to the works of the great trio, Architecture, Sculpture, and Painting.

We are pleased to learn from the remarks of Mr. R. H. Dawson, A.R.C.A., Headmaster of the Belfast School of Art, at a recent meeting of the Irish District of the Society of Art Masters, that the teaching and appreciation of art in Ireland has made satisfactory progress during the last fifteen years, and that it is recognised that art teaching is not only valuable as a specialised form of instruction, but is also useful as an important element in general education.

An interesting discussion took place at the last meeting of the Tipperary County Council as to the preference to be given as between ferro-concrete and steel for a proposed new bridge to be erected over the River Suir at Waterford. In the estimates before the Council there appeared to be a difference of 200*l.* only in favour of ferro-concrete in an amount of 67,000*l.*, but it was not quite clear as to whether the depth of the foundations below the river mud was sufficient in the case of the ferro-concrete estimate. The general opinion of the Council was rather in favour of a steel bridge, although it seemed that the Privy Council was inclined to give preference to ferro-concrete.

Although the French Chamber and Senate have passed a vote to permit the purchase of the Farnese Palace as a permanent home for the French Embassy in

Rome, it seems that this purchase is conditional on the consent of the Italian Government to the alienation, which in 1861 was forbidden by PIUS IX. in favour of the Apostolic Chamber or the Pontifical Treasury. The prohibition has passed to the Italian State as the Papal heirs. We trust that the natural desire of Italy to retain its artistic treasures may not operate to send the Palazzo Farnese to a worse fate than that of becoming the abode of the French Embassy.

OF the results of archæological discovery during the past year few have been more valuable or more interesting than those in Nubia, where it has been shown that in the Pre-Dynastic period of Egyptian history, from about 4000 to 3500 B.C., Nubia was inhabited by the Egyptian race having the same culture as in Egypt. Copper was little used and appeared only as ornaments. On the other hand, tools and weapons were of stone, and the working of stone vases and bowls as well as the preparation of flint knives and lanceheads had reached a high state of perfection. The Early Dynastic period (3500-3000 B.C.) which followed showed copper weapons coming into use, and hand-made pottery was abundant. Culture at this time in Nubia was falling behind that of Egypt, as the centre of gravity of Egyptian power moved northwards into Middle Egypt and negro influences entered Nubia from the south. The next period (2800-1800 B.C.), corresponding to the Old Kingdom of Egypt, saw a marked change in Nubia. Culture was advancing slowly and was crude in type, and anatomical evidence fully established the development of a hybrid type derived from a strong intermingling of the negro from the south with the original Egyptian. This crude Egypto-Negro mixture became a more homogeneous blend in the succeeding period, Middle Kingdom of Egypt 2000-1500 B.C., and a Nubian physical type was produced which had remained dominant in this portion of the Nile Valley from that time down to the present day.

NOT only has the origin of the Nubian race been worked out, but great additions had been made to the history of disease from records extending over sixty centuries. In the fourth and fifth centuries bodies packed in salt and laid in the dry soil had preserved not only skin and hair, but every internal organ, muscle, nerve and vessel; gout, and even appendicitis, were recognised among the ailments that had afflicted dwellers in Nubia. Tuberculous disease was located rarely, but rheumatic gout was remarkably common in the early Pre-Dynastic cemeteries.

THE work of the National Trust for Places of Historic Interest or Natural Beauty deserves to be better known, and at a recent meeting of the Sheffield Society of Architects and Surveyors, Mr. NIGEL BOND, M.A., Secretary of the Trust, pointed out the principles and methods of the Corporation.

MR. BOND explained that the Trust stood for the preservation of the beautiful and the historic. This country possessed a great mass of beautiful landscapes and beautiful architecture, but in diminishing quantity, and it was felt that in the interests of the nation and of national interests that as much as possible should be done, without interfering unduly with other interests, to preserve the beauty of that architecture. The Trust also stood for other interests besides the æsthetic and the architectural. There were existing many good examples of that continuity which is one of its main features, showing how one event glided, so to speak, into another, and went forward without any great breaks.

To preserve the evidences of that continuity could not fail to be of great educational value, as it enabled us better to judge the most important political issues which arose from time to time. It was important that historical buildings should be preserved to help us to remember and appreciate what had gone before, and understand it better. Hence the Trust was preserving not natural beauty alone, but also historical associations, and anything which tended to the development of historical knowledge. For instance, they recently acquired one of the long barrows in Wiltshire, which had been in danger of destruction, and such objects would probably be extremely helpful in the future in developing theories about anthropology in the event of the study of that science being taken up. It would be seen that the Trust covered very wide ground. In fact, there was no æsthetic or intellectual interest which did not find sympathy in it. The speaker mentioned that the famous view of Windsor Castle from the river was recently threatened with destruction by the piece of land separating the building from the river being built upon, but the Trust had stepped in, and was now endeavouring to raise 3,000*l.* for the purchase of the site. Towards this fund the KING had contributed 500*l.* and the PRINCE OF WALES 250*l.*

SOME details were given of the constitution of the Trust. In its earlier days a limited company, it was incorporated two years ago, and had been recognised by Parliament as a suitable body for holding objects and places in trust for all time. Their present status constituted a guarantee that properties acquired by them requiring special management would be governed by a body capable of providing the best possible expert advice.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

### II.—INSULATING MATERIALS—(*continued*).

*Sawdust.*

THIS material is so familiar that it is scarcely necessary to give an account of its manufacture. As an insulator its only merit is its cheapness. It has a fair resistance to heat (especially if it has been first spread and kiln-dried), but affords no protection whatsoever against fire, and owing to its spongy nature has a fatal tendency to absorb moisture. It is also rather subject to the malignant fungoid growth known to timber merchants as "dry rot." The packing weight is about 14 lb. per cubic foot, giving a covering capacity at 6 inches thickness of 320 feet super per ton, and the cost in most places is about 1*s.* per cwt. sack. As an insulator for large cold stores it has very little vogue, and is only used in the cheaper forms of ice rooms.

*Cowhair.*—Cowhair is cleaned with acid, thoroughly washed and dried in centrifugal machines by the merchants, and is then prepared for cold-storage purposes by teasing in what is known as a "teaser" or carding machine, which is very similar to a large comb. By this means it is torn into shreds and cleared of all matted lumps without the natural strength of its fibre being destroyed. The effect is to increase the covering capacity by diminishing the weight per cubic foot, and at the same time to render it more efficient as an insulator by avoiding solid masses and providing a large number of air cells. The advantage of cowhair is that it is light and fairly inexpensive, and it has no tendency to absorb moisture. For this reason it is frequently used in lagging evaporators and small ice-making tanks, especially when they are for export purposes, where lightness is very important. Its disadvantage is that in course of time it is liable to become a little musty owing to slight decomposition being set up.

The weight per cubic foot averages 6 lb., giving a covering capacity of 746 feet super per ton at a thickness of 6 inches, and the cost is usually about 19*s.* per cwt.

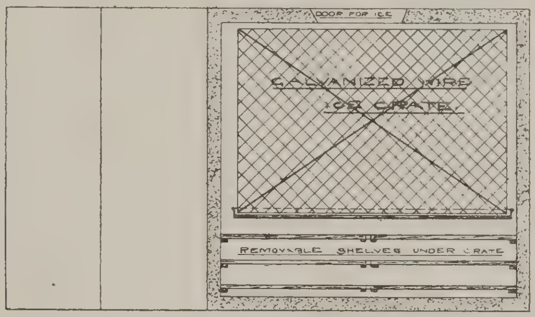
*Peat Moss Litter.*—Although not quite so well known in this country, peat moss litter is used to a certain extent by cold-storage engineers in Germany. Unfortunately, no exact figures are available of the actual heat leakage it permits, but the results obtained in practice indicate that it is fairly efficient. The raw peat from which it is produced is found in large quantities in most moorland districts, such as Yorkshire, Cumberland, Derbyshire, and the greater part of Scotland, and is converted to a litter by the simple process of drying thoroughly in air and then disintegrating. It is afterwards pressed into bales for transit, at a pressure of some 200 lb. per square inch, in which state a cubic foot weighs about 16 lb. When packed for cold-storage purposes, however, it is considerably lighter, and its weight then averages 11 lb. per foot cube, giving, at the standard thickness of 6 inches, a covering capacity of 409 feet super per ton.

Owing to the plentiful nature of the supply and the simple process of manufacture, the cost is not excessive, and in most places it may be obtained at about 35*s.* per ton.

Peat is largely used in Scotland and elsewhere as fuel, and therefore, although not readily inflammable, it cannot be regarded as fire-proof. On the other hand, it does not attract moisture, and the tannin included in its composition not only prevents decay of the moss itself, but exerts a preservative effect on the timber which cases it in. The same cause renders it immune from the attacks of vermin. As an instance of its powers of preservation may be mentioned the body of a Roman lady, which was unearthed some time ago from the celebrated Chat Moss. Although it must have lain there for centuries, its condition was practically perfect.

The materials described above are those which are chiefly used for the actual insulation. Many others have been tried, such as hair felt, rice husks, and pumice; but none of these, in this country at any rate, has attained to any measure of success. Pumice to a certain extent is used in the United States, and felt is largely employed for insulating cold brine pipes, but the husks, owing to their tendency to vegetable decay and their attraction for vermin, have now very little vogue at all. Fossil meal, of course, is an insulator, but is usually found only on steam surfaces, where it can be applied in a hot state.

Other materials sometimes specified for floors in cold stores and curing cellars are bitumen, asphalte, concrete, engine ashes and cement. White tiles are also employed for facing purposes, and zinc and galvanised sheets for lining ice chambers and covering damp walls. These are all too well known to need description, but attention may be drawn, in passing, to the walls, made from hollow concrete blocks, which have recently developed. These are highly recommended for buildings to contain cold stores, as the dead air space formed inside each block is one of the best insulators known. Further, it will probably be news to some that buildings of any size made from these blocks are actually cheaper than those constructed from corrugated iron.



SECTIONAL ELEVATION.

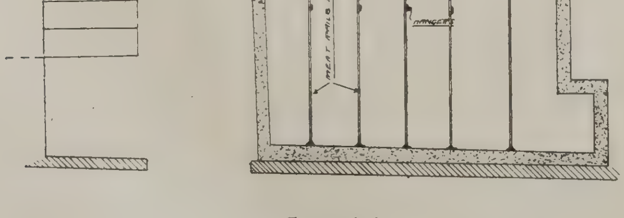


FIG. 3.—PLAN.

Timber is a very important factor in cold-storage construction, and too much attention cannot be paid to its selection. It should be free from sapwood, knots or shakes, and any with the least sign of rot should be rejected. Timber rot is of two kinds: the wet form, which is due to a species of fermentation, and the dry variety, due to fungoid growth. Either has most pernicious effects on the insulation, and must be carefully avoided. This can be done by selection in the first instance, and afterwards by taking proper precautions. No dampness should ever be allowed to approach the insulation, and the filling used should, as far as possible, tend to prevent decay. Preservatives are occasionally employed, especially in marine work, and there are many of these on the market to choose from. Most of them are simply applied with a brush or by soaking, but there is also the well-known process of "burnettizing." This consists in exhausting the air and moisture from the wood in an air-tight cylinder by means of a vacuum and then forcing in preservative under pressure. Different woods, it should be noted, absorb different amounts of preservative, and the pressure varies in each case.

Both for sheeting and studding ordinary white deal does very well. Yellow deal, on the contrary, should be avoided, as it gives off a very noticeable smell, which is taken up by the goods in storage; but spruce, although rather expensive, may be used with advantage in small work. In any case, the timber, if painted, should be finished off inside with enamel, in order that it may be cleaned down at intervals with a damp cloth.

Appended below is a table culled from many experiments and from working results, which summarises the data already given under the various insulators, and in addition states the heat resistance of each:—

| | Heat Leakage B.T.U.'s per Square Foot per Hour.* | Weight per Cubic Foot. | Covering Capacity Foot Super per Ton at 6 Inches. | Cost per Ton. | | | Cost per Foot Super 6 Inches Thick. |
|---|---|---|---|---|---|---|---|
| | | | | £ | s. | d. | |
| Mineral wool . | 0·06 | 14 | 320 | 3 | 0 | 0 | 2·25 |
| Cork . . | 0·07 | 6 | 746 | 7 | 5 | 0 | 2·33 |
| Cork slabs . | 0·05 | 12 | 373 | | — | | 22·5 |
| Charcoal . . | 0·07 | 12 | 373 | 3 | 0 | 0 | 1·93 |
| Sawdust . . | 0·10 | 14 | 320 | 1 | 0 | 0 | 0·75 |
| Cowhair . . | 0·06 | 6 | 746 | 19 | 0 | 0 | 6·2 |
| Peat moss litter | 0·15 approx. | 11 | 409 | 1 | 15 | 0 | 1·03 |

* This column is calculated on the basis of a difference of temperature of 50 degrees Fahr.

*Ice Chambers.*—Ice, either alone or mixed with salt, is now, unless under special conditions, used for cooling storage rooms only when they are not large enough to make the installation of a refrigerating machine advisable. But before the experiments with machines had led to practical results it was the only method available, and as such was universally employed where cold storage was necessary. The ice trade in those days was therefore of considerable importance, and as natural ice had at that time no competitors, Norway and North America, which were then, and are still, the chief sources of supply, did a very large export business in this commodity. The Americans were first in the field, and the Lake Wenham Ice Company began to tap the British market as early as 1840. But it was not long before the Norwegians followed up, which they did with such energy that ultimately, owing to their superior transport facilities, they captured the whole of our trade from the Americans, and at the present day they still, as far as natural ice is concerned, maintain their supremacy. They have now, however, other rivals to fear in the shape of the large ice factories which have followed the advent of mechanical refrigeration, and artificial ice, except in the eastern and northern counties, which are fed by the big seaports, is steadily regaining all the ground once lost by the Americans. Already the number of factories in existence is very large, but principally owing to the reduced costs of production obtained with up-to-date methods it is increasing steadily year by year. In America, although ice factories are far more plentiful even than they are here, a great quantity of natural ice is still harvested every winter, and elaborate methods have been invented for handling it with the minimum of expense. The cutting and trimming machines, the elevators, and the huge ice houses employed are of great interest, but as they do not concern us here it is not intended to do more than mention their existence. Suffice it to say that in this country there is a plentiful supply of ice, both natural and artificial, which enables the user of small ice chambers to store his provisions at a not unreasonable cost.

By far the greatest number of ice rooms at the present date are used by butchers, whose trade renders the use of some form of cold storage a necessity. The larger establishments are mostly fitted by their owners with refrigerating machinery, but those whose business does not warrant the capital outlay which is necessary to put down a complete plant prefer to use the ordinary ice chamber. In this way, although the running costs are considerably higher, they save in initial expenditure.

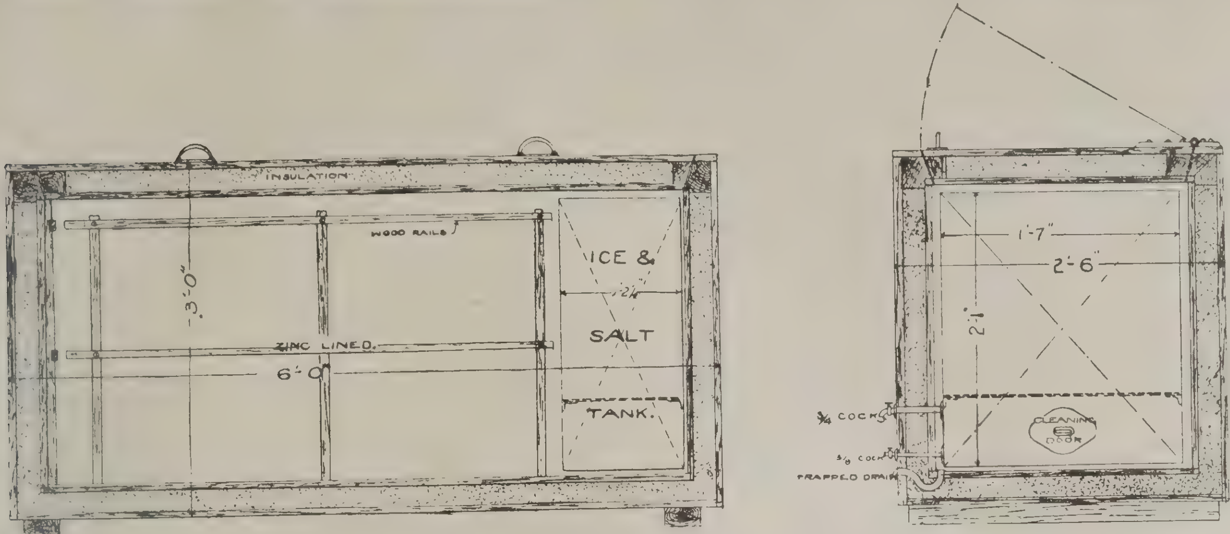


Fig. 4.—Arrangement of small box cooled by ice and salt.

But while some prefer ice cooling to mechanical refrigeration for the reason mentioned, or from personal taste, there are very few butchers indeed who have no form of cold storage at all on their premises. It will therefore be seen that to satisfy this demand alone the number of ice chambers supplied yearly must be very large.

Next to the meat trade the most important application of large and small ice rooms is in hotels, restaurants, and country residences. In the two first-named they are used for storing all sorts of provisions, and as a more efficient and less troublesome method of icing wines, champagnes, &c., than the ordinary pail. Their use in country houses is obvious; so many of these mansions are at such a distance from centres where suitable provisions may be obtained that it becomes almost imperative to have some means of preservation in order to save unnecessary journeys and expense. For this purpose and for storing game small ice chambers have been specially designed, and are now widely employed. Other important users are provision dealers, fishmongers, poulterers, and dairymen, and ice cooling is also resorted to by the smaller bacon-curers.

It is scarcely possible to draw a definite dividing line and to say at what storing capacity ice cooling should cease and mechanical refrigeration begin. Much depends on circumstances and the purpose for which the cold store in question is being used. A very important factor too is the personal opinion of the purchaser, many of whom are unduly prejudiced on one side or the other. In one case, perhaps, a butcher who has a rising trade may not have accumulated sufficient capital to think of a machine. He is bound, however, to have a cold store of some sort, and he therefore, going along the line of least resistance, buys a large ice chamber. By doing so, although his ultimate running costs are quadrupled, he spends at the time perhaps only one-fourth of what he would pay for the complete mechanical equipment. On the other hand, for hotels or country houses, where capital is usually available and will be gladly expended if convenience is thereby gained, the refrigerating machine should be advised wherever practicable, especially as it very soon saves its extra cost by its small attendance and upkeep expenses. These instances may be multiplied *ad infinitum*, and it is easily seen by considering a few of them that the line of demarcation is very vague. An approximate figure, however, will be useful as a practical guide, and although it will vary a great deal in different circumstances, the limiting value for ice-cooled rooms under ordinary circumstances may be set at 200 cubic feet of inside capacity. There are, of course, many rooms smaller than this which are cooled mechanically, and many larger which are cooled by ice. In fact, only last summer there was built in London an ice chamber having a capacity inside the walls of 700 cubic feet, which is shown in fig. 3. On the other hand, it is believed that machines will shortly be placed on the market suitable for dealing with capacities as low as 120 cubic feet. But these cases are more the exception than the rule, and the above figure, although purely arbitrary, may be taken as giving a very fair idea of modern practice.

Ice rooms divide themselves naturally into two classes—those cooled by ice blocks and those using broken ice mixed with salt. The latter are used for obtaining lower temperatures than are possible with ice alone, which they are able to do owing to the fact that the melting-point of the salt solution is well below that of ordinary water.

Working with the block ice the thermometer inside a well-constructed room will register from 40° to 44° F., which is a temperature very suitable for the storage of most provisions during short periods. Lower temperatures may be obtained without the use of salt, calcium chloride, or other solid, but such a proceeding is not advised, as cooling below 40° is a very slow process if ice alone is employed. The reason for this is found in a physical axiom well known in Newton's law, which states "that the rate of cooling varies exactly as the difference in temperature." In other words,

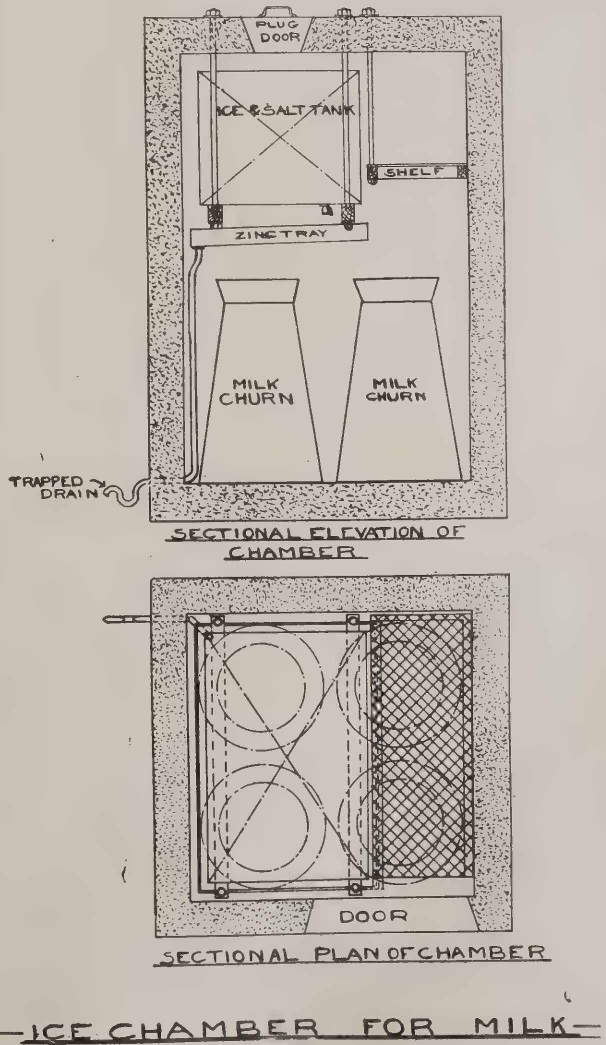


Fig. 5.

the nearer the temperature of its surroundings is to 32° F., the longer 1 lb. of ice takes to melt and dissipate its heat of fusion (*i.e.* heat it gives up in turning to water). Hence at temperatures below 40° cooling takes place very slowly.

Low temperatures should be avoided wherever possible, as the effect is always to increase the consumption of ice, firstly, because more B.T.U.'s must be extracted from the produce stored, and secondly, by reason of the greater radiation losses, which by Newton's law are proportional to the temperature difference between the inside of the chamber and the atmosphere. Such temperatures are unnecessary in ordinary circumstances, but if the produce is to be stored for any length of time they are essential, and in that case ice and salt tanks instead of plain ice crates should be employed.

The ice and salt tank, like all other cold-storage fittings, must be galvanised to prevent rusting from moisture condensation, and must be fitted with a perforated plate, from 3 to 6 inches off the bottom, according to size, in order to obviate damage through the falling of extra large pieces of ice. It should also have a liquid outlet, controlled in small tanks by a pit cock, and in the larger sizes by a wheel valve. In fact, it is advantageous to have two of these outlets, as shown in the small horizontal box illustrated in fig. 4. The larger of the two is situated just under the perforated plate, and prevents the liquid salt solution from penetrating to the ice above, thereby causing it to melt with undue rapidity. At the same time it does not waste the intensely cold liquid at the bottom, which is still capable of doing very good cooling work. The smaller cock is in order to drain the tank completely when not in use, and a hand hole in one side is provided for cleaning purposes. The box shown in the illustration is lined with zinc, and it is therefore unnecessary to have a drip tray under the tank to catch the condensed moisture. The drips simply drop on to the zinc-covered bottom, which is arranged to fall towards one corner, whence a trapped waste pipe conducts the water to the outside of the box. By means of this trap an effectual water seal is formed, which, while allowing water to escape, prevents air from flowing in. The insulation in this case is composed of 2 inches silicate cotton between T 98 B matching, and wooden rails are fixed round the inside for the purpose of hanging small goods to be stored.

Another form of the ice and salt chamber much used by dairymen is shown in fig. 5. Churns, it will be seen, are stored on the floor, and a shelf is provided for carrying butter, cheese, &c.

(*To be continued.*)

## BEAUTY IN ARCHITECTURE,

By B. R. Gribbon.

(*Continued from last week.*)

So, too, in the Colosseum, how the endless rows of arches carry the eye onward to cover the whole building. One can scarcely conceive of a "part" of the Colosseum; it forces itself upon the mind as a whole. It is here too that the value of mass and repetition is very strikingly shown. The orders of the building are ill-proportioned and roughly worked, the outlines of the mouldings are coarse and poorly designed—compare them with those of the Parthenon—yet, thanks to its size and its constantly recurring arcades, the Colosseum is the very embodiment of strength and will always rank as one of the most impressive buildings of the world.

We have said that repose is essential to the appearance of solidity and strength, but repose must not be confounded with lifelessness. Repose may be either inert or alert. One of the finest examples of the former is found in the Pyramids: they are the very ideal of inert repose; while the Theseion is another good example. None of these buildings convey the faintest impression of expectant life, but the case is very different when the arch is confessedly used. Turning again to the Colosseum, does not the constant repetition of the bold semi-arches lead the eye on and on, suggesting at least orderly preparation, a readiness in each to bear its part in supporting any weight thrust upon them? And this rather seems to accentuate than to diminish the repose of the building as a whole.

After solidity, or more correctly speaking, with it, comes proportion. The essence of this factor is fitness. It is obvious on the most casual examination that there are some proportions which are always pleasing to the eye, and it will be found that this is the case according to the apparent fitness of the different portions of the design to fulfil their respective requirements. Considering proportion in design as a whole, it may be said that it is the proper adaptation of parts to an end, it is the relative size of the parts to each other and to the whole, and it is one of the most important factors in producing unity in a design, thus helping to give the expression of strength and solidity which, as we have already said, is the first necessity to obtain beauty in architecture. How great its importance was in Classic times may be seen in the existing remains of the temples of ancient Greece. From the natural size of the various component parts, steps, columns, the lintels of the entablature, the cornice and its mouldings, in such early buildings as the Hieron and the Temple of Corinth, to the perfected details of the Parthenon and the monumental ones of the Temple of Jupiter at Agrigentum; in these and in all the varying examples lying between them in the evolution of the perfect Greek style, the factor of proportion is practically the key-note of the design. Could a clearer illustration of this be found than in the inner portion of the Propylæa and in the Epinaos of the Parthenon at Athens? The order externally and the general design in each case is Doric, yet when it became necessary to insert columns internally, where great bulk would be undesirable, rather than weaken the robust proportions of the Doric column, it is rejected altogether and the designer deliberately turns to the Ionic, and so obtains a column of the necessary height without inconveniently encumbering his building and without any sacrifice of the all-important factor of proportion.

So also in Roman work. The accepted height for the Corinthian column was ten diameters, but in the case of the Temple of Vesta at Tivoli, where, from its site close by the crest of a lofty cliff, the usual height would tend to give the column an appearance of weakness and attenuation, it is reduced from ten to under nine and a half (9.47) diameters, and not only this, but the proportions of the entablature, the contours of the mouldings, and the intercolumniation itself are all altered in sympathy. True, in some cases, as in the Theatre of Marcellus and the Colosseum, the proportion of the several orders and their details is not so carefully observed, but in these cases the effect of the design would have been even finer had the proportion been more closely attended to.

The special qualities which proportion has the power to produce, or to assist in producing, are refinement and grace. Refinement is the best possible adaptation of means to an end; it is usually understood to mean slight variation of detail to emphasise the functions and purpose of the parts affected, or to correct apparent defects as opposed to real ones: thus it is in reality a variation of proportion. Grace is more difficult to define; it seems to be produced partly by extreme refinement of detail and ornament, and partly by beauty of line and form, and thus, according to our definition of "beauty," of the fullest expression of purpose in form. Careful finish and definition of outline are also essential to full expression of grace, as is perfectly illustrated in the marble mouldings of the Athenian temples.

The third of Inigo Jones's requirements is that architecture shall be masculine. This implies strength, vitality and restraint.

Strength, as we have said when discussing solidity, to the appearance of which it greatly conduces, is obtained by the careful disposition of voids and solids, by refraining from placing a heavy mass over a void, by placing the hardest and strongest materials and the largest details at the base of the building, and by the careful subordination and proportion of parts. Ornament should be sparingly used in the lower storeys; it may be introduced more liberally on each successive storey as the building rises, and will then help to give the appearance of lightness to the upper portions essential to the appearance of strength in the whole. The design should not be cut up into more divisions than is necessary, unless they are uniform and symmetrical; few parts conduce to unity, and a building possessing breadth and unity always *appears* to be stronger than one actually equally strong but cut up into a multiplicity of varying parts.

(*To be concluded.*)

Messrs. Gotch & Saunders, architects, Kettering, have been appointed by the Northamptonshire education committee architects for the Kettering Grammar School.

The following names of candidates for the appointment of city engineer at Newcastle-on-Tyne are to be considered by the Corporation:—Mr. J. Rush Dixon, of Woolwich; Mr. A. D. Greatorex, of West Bromwich; Mr. E. B. B. Newton, of Paddington, and Mr. W. J. Steele, of Bristol.

## WELLS AND GLASTONBURY.*

WELLS probably owes its immunity from desecration to the secular character of its church, in consequence of which it escaped the upheaval that overthrew other religious houses at the time of the Reformation. The city possesses a peculiar charm being situated at the foot of the Mendip Hills, and having been handed down to us from the Medieval times practically unaltered, still retains its old world characteristics and ecclesiastical atmosphere which is unique. The central feature of the city, the cathedral church of St. Andrew, is of old foundation, and was from the first served by secular canons. The usual monastic buildings do not appear, but instead we have the Vicars' Close, one of the most interesting features. It should be noted that the cloisters were merely a walk for the clergy and not the busy working place of an active monastery. King INA was the founder of the first secular church, upon the foundations of which Bishop JOCELINE raised (1220-42) the fine nave and the west façade, so well known to all interested in architecture that it is superfluous to comment on this work here. The Vicars' Close, with its chain gate and gallery, however, are the chief subjects of these notes.

Bishop JOCELINE DE WELLES, or TROTMAN, returned from his five years' exile in 1213, and then started rebuilding and improving his cathedral church of Wells, which he dedicated in October 1239. Two years previously he had ordained chantry priests, but there is no reference to any common residence for these vicars choral. They do not seem to have had any regular establishment until WALTER DE HULLE in 1334 gave some land in Wells, so that the thirteen chantry priests might live in common together. It was RADULPHUS DE SALOPIA, or RALPH OF SHREWSBURY, who in 1348 began to erect a new college on the west side of the cloisters for their residence: "hall, kitchen, bakehouse, and other houses in the same place built and to be built."

Time must have made sad havoc of the buildings erected by this prelate, as only a few traces now remain of the original design.

The great benefactor, Bishop RALPH ERGHUM, in his will requested his executors to build a college in the street then called La Mountery, but afterwards College Lane, for fourteen priests and chaplains, that they might live in common together. This has by some been confounded with the Vicars' Close, and the foundation of a neat little college for vicars and singing men on the north side of the cathedral is attributed to this prelate. T. L. WALKER, in "Examples of Gothic Architecture," says that Mountery College, or Mounterox College, was destroyed and its revenues confiscated at the time of the suppression of the monasteries. There are references to Letters of Patent in the time of RICHARD II. and HENRY V. which are grants to this college. NICOLAS BUBWITH's arms occur on the door of the chapel at the north end of the Close, and also on the painted glass in the windows. It may therefore safely be supposed that the grant in HENRY V.'s time was bestowed by him, but several signs, viz. the character of the carving and the mouldings to some of the windows signify an earlier date. Various small alterations have taken place, but the next principal addition was made by Bishop THOMAS BECKINGTON (1385-1464), who built the Close Hall Gate, or Chain Gate, which connects the hall of the Vicars' Close with the staircase of the chapter-house, and forms a private passage whereby the singers may pass from the church to their quarters.

This gateway forms an entrance into the cathedral close from the west, and consists of a vaulted carriageway and a passage on each side for pedestrians; over these is a gallery of communication for the vicars choral when going to and fro to perform service in the choir. This building is excellent in design, with mouldings beautifully executed in fretstone.

Over the central arch are two compartments, or bays, divided by enriched shafts terminating in crocketted pinnacles above a panelled parapet. Each bay contains a window of two lights divided by a transome with a canopied niche and a statue in the centre; these windows form distinct lights inside.

Over each passage is a window with two lights and similar tracery, and the same design of fenestration continued up to the north wall of the chapter-house staircase. Bishop BECKINGTON's arms and rebus occur three times on the gateway, viz. on the central boss of the vaulting and under each of the two windows of the small anteroom communicating from the hall to the gallery. Two corbels over the central archway displaying angels bearing a mitre with labels attached complete his armorial bearings. These and the statues in the niches are much decayed, but the one on the west elevation is supposed to be that of St. ANDREW.

Among others of Bishop BECKINGTON's buildings still existing and worthy of note are the Palace Eye and the Penniless Porch.

This eminent person is characterised by GODWIN as "a good statesman, a good churchman, a good townsman, a good subject, a good kinsman, a good master, and a good man." Surely he ought to have added "a good builder," if one is to believe that BECKINGTON was his own architect. He is supposed to have acquired his knowledge of building from WILLIAM DE WICKHAM, or WYKEHAM, which is not improbable, having been patronised by that distinguished prelate.

The executors of BECKINGTON, RICHARD SWAN, HUGH SUGAR, and JOHN POPE, *alias* TALBOT, may be safely attributed to have completed the Vicars' Close by adding—and probably rebuilding most of it—and thus rendering it the most beautiful of its kind in England. Their rebuses are introduced in the chimney shafts of the houses.

In spite of the great vandalism having ruined and laid waste such an immense amount of our Medieval architecture, Wells still possesses an infinite charm, and ranges among the best and the most delightful of cathedral towns, and it owes a great deal to those who are at present responsible for the upkeep and repair. It seems that they have been fortunate in striking the happy medium between repairing and restoration—preservation being their motto.

### GLASTONBURY.

Though the town of Glastonbury bears no prosperous or progressive air, it has its former venerable history, which is not without flavour of stirring times, lying in a valley green with orchards, with a little river, the Brue, almost surrounding it.

The two principal streets form a cross, and on either hand rises the Tor, crowned by its solitary tower—a remnant of a thirteenth century church—seeming to keep watch over the town.

The principal entrance to the abbey church used to be on the west, on a site now occupied by the "Red Lion Hotel," and led into the church by way of St. Joseph's Chapel. Of the latter, the most beautiful feature still in existence is the Norman doorway (*see* sketch) on the northern side, consisting of four elaborately-carved arches ornamented with emblematic figures. It was begun in the reign of HENRY II. and finished in that of RICHARD I., and its architecture shows the transition in styles from Norman to Early English. At each of the corners was a turret, one of which still exists, arcaded and surmounted by a spire. Underneath the chapel are the remains of a twelfth century crypt, which was discovered in 1825. In the same year a well on the south side of the crypt was discovered.

Of the rest of the great church, once the most magnificent in the kingdom, there now remain only three bays of the south nave aisle, an eastern bay of each transept, the massive eastern piers of the central tower, and one of the eastern chapels of the northern transept; the south wall of the choir with its five windows is also complete. But this only gives some idea of the beauty of the perfect whole.

Of the monastic buildings, one of the most perfect ruins is that of the Abbot's kitchen, which was erected at the end of the fourteenth century, built entirely of stone and having a pyramidal roof in the shape of an octagon crowned by a double lantern.

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* See Illustration.

At each corner of this kitchen was a large fireplace, having a chimney over it. The roof is supported on the inside by eight curved ribs, and has eight louvres for letting out the steam. Inside the outer lantern was a smaller one wherein was hung the bell that used to call the poor to the almonry.

Another of the monastic buildings still almost intact is the abbey barn, which stands at the corner of Bere Lane, on the Pennard Road, and is 93 feet long by 63 feet broad and 36 feet high. This was used for storing the grain supplied by tenants in lieu of rent. The windows still show some rich detail, and at the extremity of each gable is a carved figure, one representing the Virgin Mary, and the other the abbot who built the barn.

## LLANDAFF CATHEDRAL.*

By S. Bowen Williams, M.S.A.

(*Continued from last week.*)

In spite of a few repairs made after the Restoration the building went from bad to worse. The south tower was roofless, the battlements of the north tower fell through the nave roof, and about 50 feet of the nave itself fell. In this state it was nothing but a picturesque ruin. The Lady chapel was best preserved, and the services were held in this portion of the cathedral. The choral services were, however, discontinued after 1691, and the choir disbanded. About this time it was suggested that the see should be moved to Cardiff, but fortunately this was not done. But in 1732 it was decided to call in a Mr. Wood, of Bath, to advise and estimate the cost of restoration or repairs. His report was a remarkable one, and as a result there arose one of the most extraordinary perversions ever seen in an English church. Deeming the existing building hopeless, he proceeded to erect within the roofless walls another church, and what a church! His building was of Classic or Italian design with pedimented front, and produced the most incongruous effect it is possible to imagine. The hideous anomaly of a badly designed Classic temple rising amidst the ruins of a Gothic cathedral can better be imagined than described. A sketch of its appearance is to be found in Freeman's History of the Cathedral, and is well worth seeing, as exhibiting to what a low ebb the national taste had descended, and also the pitiable state of the original church.

This church of Mr. Wood's occupied the presbytery, choir, and nearly half the nave of the cathedral. The Gothic details were covered with plaster and generally misused.

The south tower had become dangerous and was taken down for the greater part.

This then is the state to which the splendid fabric of the fourteenth and fifteenth century had descended: the original church in a miserable state of decay and neglect, and Mr. Wood's monstrosity rising inside it. And so it remained until nearly the middle of the nineteenth century. In 1835 the Precentor had the east window of the Lady chapel restored. Mr. Wood had cut away the stone tracery and inserted a wood window in its place. Later on the Rev. Bruce Knight, the first dean since the twelfth century, began to move in earnest; money was collected, and as a first step the Lady chapel was restored. The Italian defamation was next taken down, and the choir, presbytery, and eastern portion of the nave, restored to some of its pristine splendour, was reopened on April 16, 1857. The choir of Gloucester Cathedral attended and gave the first choral service since 1691. Efforts to complete the restoration were not relaxed, and after a most excellent sermon by Bishop Wilberforce, a sum of nearly 3,000*l.* was at once subscribed. The repairs of the west end began, a new tower and spire on the south-west angle were commenced, and work went on continually until final completion in 1869.

The old cathedral had risen, phœnix-like, from its ashes, more splendid than before, a material example of the devotion of the people to their religion. Prominent in the movement were Deans Bruce Knight and his successors, Conybeare and Williams, and Bishop Ollivant, who laboured incessantly to this end. We must not forget, too, Mr. Pritchard, the architect, a native of Llandaff, to whom the restoration is a tribute and a record of the time and love he spent on it. He lies buried in the cathedral, and of him as of Wren it may truly be said, "*Si monumentum requiris, circumspice.*"

The restoration is one of the few which were not undertaken by the late Sir Gilbert Scott. It is the most complete and certainly one of the most successful. It was carried out in the most conservative manner, and all the original work has been preserved wherever possible. The only really new portion is the tower and spire at the south-west angle. The original tower had been completely destroyed, and this new tower and spire which replaces it is a particularly happy conception and one of the finest pieces of work of modern times. Taken as a whole the restoration reflects the greatest credit on all concerned. Other cathedrals may be, and are, far finer and more perfect, but none have ever risen so excellently after such hopeless ruin. The only comparison is the restoration of Lichfield, which was destroyed by the Cromwellians.

This then is briefly the history of the cathedral, and by no means an uninteresting history. I will now proceed to touch upon a few of the more important architectural features and such other circumstances as impress the mind or are deserving of recognition.

First of all its position. Lying as it does snugly ensconced under the side of a hill, and hidden from view if approached from the south or south-west sides, it occupies a most unique position; rarely do you find a cathedral so placed. Compare it with Durham Cathedral, towering majestically on an eminence overlooking the Wear, a landmark for miles around; or Salisbury, lying in the middle of a wide plain. Yet it always seems to me such an appropriate position for Llandaff Cathedral. Here we have not got a bold towering mass or a variety of steepled soaring towers which, as it were, compel the attention of the eye, but we have a church which seems conscious of its own modest pretensions, and so half reveals and half hides itself beneath a convenient ridge, leaving its beautiful spire to just indicate its whereabouts.

In my opinion few cathedrals are better placed. It seems to have grown in its present position like some organic part of the country around, and fits in its place just as much as the trees and hills.

Now to proceed to its plan. This is simple, very like an enlarged parish church. In fact, many parish churches could be mentioned which exceed it in size. It is long and narrow, with single aisles to nave and choir, but no transepts. Its length, exclusive of Lady chapel, is 200 feet, and its width between aisle walls is 70 feet. You see therefore that it is very small compared with some of the better-known cathedrals. The chapter-house is on the south side and opens off the aisle of the choir.

(*To be continued.*)

## ILLUSTRATIONS.

### CATHEDRAL SERIES, LLANDAFF.—WEST FRONT.

The description of Llandaff Cathedral is continued, and this view forms one of the series of illustrations.

### SKETCHES IN SOMERSET.

These sketches are part of a series by Mr. John Th. Westbye, which we shall continue in following issues, and of which the article on Wells and Glastonbury, also by Mr. Westbye, is explanatory.

### COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES READING.

This design, by Mr. T. Lawrence Dale and Mr. A. G. Horsnell, is one of the many submitted in this competition, which, though containing good work, were not fortunate enough to gain a premium.

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* See Illustration.

## HOUSING AND TOWN PLANNING.*

THE author, in commenting upon sections 1 to 9 of the Housing Acts, which deal with the facilities for acquisition of lands for the laying-out of roads and the housing of the working classes, expressed the hope that district councils would not embark in any building schemes which involved speculation with the ratepayers' money unless they were thoroughly satisfied that the schemes could be carried out without a charge upon the rates. Otherwise, he suggested, it would be very unfair to ratepayers who were erecting houses in competition, or who had already made proper provision for the housing of labourers working on their estates. The stipulation that the arbitrator was to act on his own knowledge and experience must appeal, said Mr. Willmot, to all members of the Surveyors' Institution, and would lead them to hope that practical valuers might be appointed to those posts, although that was contrary to what was stated by the President of the Local Government Board in the House of Commons. The arbitrator might not, except with the permission of the Board, hear counsel or expert witnesses, which made it all the more necessary that a practical valuer should be appointed. In any event it was to be desired that permission for seeking the advice of those who were qualified to express an opinion as to value would not be withheld from the arbitrator. In the case of closing and demolition under Part II. of the principal Act, they had a simplified process, as, instead of an order being made by a court of summary jurisdiction with an appeal to Quarter Sessions, an order could now be made by the local authority with an appeal to the Board. The author of the paper could not find that any procedure was set out for the issue of a closing order by a local authority. Section 17 (3) provided for service of notice on an owner; he should, however, have proper notice that a closing order was being considered, and should be given an opportunity of conferring with the authorities, and time should be allowed him to carry out any works which he might be prepared to do to meet the necessities of the case. The prohibition of back-to-back houses was one, he said, which must commend itself to all surveyors. There was no doubt that the erection of that class of house, except in cases where side ventilation was provided, had been a great factor in the creation of slum property. The stipulation that such houses might be erected if the medical officer of health certified that the rooms in the houses could be properly ventilated, would provide a safeguard for those cases in which circumstances might make it permissible to erect that class of house. Section 44, which empowered the Local Government Board to revoke by-laws as to new streets and buildings which in their opinion impeded the erection of houses for the working classes, would, Mr. Willmot suggested, be of great value in cases where the by-laws of a local authority provided for the construction of streets of so costly a nature as to impose a heavy charge on the land which had to be recouped out of the rents of any houses erected upon it. In many instances the by-laws as to the construction of new streets might be relaxed without putting the local authority into any worse position as regarded the maintenance of the roads. In some, indeed, he thought it would be desirable to relax the building by-laws, but he had not found that they pressed so hardly on the provision of cheap houses as did the by-laws relating to the construction of roads. The effect of the new definition of "cottage" was to increase the size of a garden from half an acre to one acre, and the limitation as to annual value was removed. Mr. Willmot, in commenting on Sections 54 to 67 of the Act, said it would be useful to consider what was meant by "town planning." The Act, he said, sets out that the general object of "town planning" was to secure proper sanitary conditions, amenity and convenience in connection with the laying-out and use of land likely to be used for building purposes, and of any neighbouring land. To secure that object, he considered, it will be necessary in preparing schemes to provide for the laying-out of land for housing purposes so as to secure the best results to the persons who will live in the houses, without having regard to the interest of any particular landowner, care being taken that in every scheme wide through main thoroughfares be provided with recreation grounds, open spaces, and small playgrounds for children, and intermediate roads so graded as to be only of sufficient width and strength to serve the purpose of affording means of communication to a limited number of houses per acre. The laying-out of the main thoroughfares should be arranged so as to allow of quick and cheap means of transit from the populous districts to the locality dealt with by the scheme. The next point to be considered was in respect to what land a scheme might be made. The words of the Act, as set out in Section 54, were wide, and most land round towns might reasonably be considered to "appear likely to be used for building purposes" at some time or other; and the fact that where land, although not likely to be built upon, was so situate with respect to any land likely to be built upon as to be essential for the carrying out of a scheme—it might be included in the scheme—should remove difficulties in dealing with large areas. The question of whether land was likely to be used for building purposes or not was left to the Board, whose decision was final. It was to be hoped that no narrow interpretation would be imposed which might prevent the laying-out of schemes to provide for through means of communication, a matter which was of the utmost importance. If this could be provided for, the development of intervening land might reasonably be left to individual effort under the general supervision of the local authority and the Board. In this country few opportunities could occur for laying out an entirely new district; most schemes would deal with land round a town, in which case all the circumstances would have to be taken into consideration and regard paid to existing highways. The proviso in Section 54 that a local authority might adopt a scheme prepared by one or more landowners was a most useful provision, of which full advantage should be taken. In the case of a large estate, a scheme, if approved by the local authority and the Board, would permit of the development of the estate on town planning lines, whereby the disadvantages that landowners now have to contend with in complying with local by-laws as to the construction of roads would be mitigated, the by-laws being relaxed to meet each individual case. In the same way a scheme by a number of landowners for the development of intermixed estates would provide for the development of the particular properties on the same lines. He hoped that in practice it would be found that schemes would be largely initiated by landowners, who by combination and agreement could more expeditiously and conveniently secure the ends in view than it was possible for a local authority to do by the use of compulsory powers. The provision of an appeal to the Local Government Board, in the event of a local authority not approving a landowner's scheme, was of great value. Section 55 gave the Board power to prescribe a set of general provisions for carrying out the general objects of schemes, but it did not appear to be obligatory upon them to do so. Regulations would, however, be urgently required, and it was to be hoped would be issued at the earliest possible moment. The regulations would act in much the same way for the Act as the Lands Clauses Act did in matters of compensation and the taking of land compulsorily, and would define and regulate the matters set out in the section and in the Fourth Schedule. The Board had to prescribe special provisions for each scheme, defining among other matters its area, and the authority who were to be responsible for carrying it out and (subject to either House of Parliament not objecting) suspending statutory enactments and by-laws.

That was a most important provision, as to his mind the success of town planning was largely dependent upon the relaxation of by-laws relating to street construction. Unless the cost of road-making can be reduced there appeared to be little prospect for the successful laying-out of estates on town planning lines; in many cases the expenditure that might reasonably be saved on road-making would be sufficient to cover the value of land given up for open spaces and to meet any depreciation in value of the building sites which might arise from a restriction being placed on the number of houses to be put up per acre. The Board might also make regulations for regulating the procedure applicable to the preparation and adoption and carrying out and enforcing a scheme. It would be convenient to have these regulations at once, as little could be done towards preparing a scheme until they were issued. One of the most important matters to be dealt with in each scheme by regulation would be the details to be specified in the plans, including, where necessary, the restrictions on the number of buildings which might be erected on each acre and the height and character of those buildings. The restriction on the number of buildings to be put up on a particular property might in some cases inflict hardship on a landowner and involve him in considerable loss, but in the majority of cases any depreciation in value caused by this restriction would, he thought, be fairly met by the power that was given to relax by-laws permitting of the construction of cheaper roads. The capital outlay would in consequence be much less, so that although the land would realise a lower rate per acre, the return to the landowner should be much the same. In the case of large estates any difference in value would be further met by the better demand there would be for land lying at a greater distance from populous places than the land to be dealt with in the scheme. Under the old conditions this outlying land would probably not be utilised for building purposes for many years. Under new conditions with successful town planning a much larger area should be brought into the market. The question of the restriction on the height and character of the buildings was an important matter. In cases where a scheme provides for the erection of small houses it was probable that the numbers would vary from twelve to possibly eighteen per acre, and when the land was used for that purpose he did not think any hardship would be inflicted by regulating the height of the buildings. On the contrary, it seemed a very useful provision, as it would prevent the erection of high tenement houses, a practice which had been carried out in Germany without giving satisfactory results. The question of prescribing the character of the buildings raised a much wider issue. It was intended, he concluded, that a scheme might prescribe whether houses, shops, public buildings, warehouses, or factories, or which of them, were to be allowed, and the area and position of the land included in the scheme which was to be devoted to each class of buildings. If this could be done the power should be exercised with great care, as undoubtedly hardships to an individual might be caused by obliging him to use his land for a purpose for which it was not well fitted. The Act precluded such an owner from obtaining compensation under this head. It was, of course, necessary for the amenities of a town planning scheme that houses and commercial buildings should not be erected indiscriminately. A scheme should be so devised as not to inflict a hardship on an owner in respect of which the Act precluded him from compensation. The proviso that the Board might make regulations for securing conferences with the landowners, and for hearing objections before the approval of a scheme, would give all owners full opportunity of laying their views as to the restriction on buildings and other matters before the authority, and they would also have a further opportunity to lodge objections to the approval of the scheme by the Board. The power of the responsible authority to enforce a scheme seemed to be limited to the removal, pulling down, or alteration of any building or other work which was in contravention of the scheme, and to executing any work which it was the duty of any person to execute under the scheme. The authority did not appear to have any power under this part of the Act to make roads and put up houses as they could under Part I. of the Act. It might happen, however, that they might have to construct roads which it was the duty of some person to execute under the scheme, and which he had neglected to do. No directions were given in the Act as to when a building or work which contravened a scheme was to be pulled down; the carrying out of a scheme would take time, and in many cases it might not be necessary to remove a building until its completion; provision to provide for this should accordingly be made in schemes where necessary. By Section 58 any person whose property was injuriously affected by the making of a town planning scheme was (with certain limitations) entitled to compensation from the responsible authority. The words of the section appeared to have a somewhat wider application than Section 63 of the Lands Clauses Act, and did not appear to limit the payment of compensation to property situate within the area of the scheme; no one could, however, obtain compensation for anything done on land included in the scheme after the time at which application for authority to prepare the scheme was made, or such other time as the Board might fix. The preparation and completion of the scheme would probably take some time, during which an owner must either postpone the development of his land or carry out the works at his own risk. The Act provided for payment of "betterment" to the responsible authority in respect of any property that was increased in value by the making of a scheme. The amount the authority could recover in respect of such property was one-half the amount of the increase. Many questions as to whether lands were injuriously affected or increased in value by the operation of a scheme were certain to arise. All such matters were to be determined by the arbitration of a single arbitrator appointed by the Board, unless the parties agreed on some other method. The proviso that where a scheme was revoked any person, who had incurred expenditure for the purpose of complying with the scheme, should be compensated so far as the expenditure was rendered abortive by the revocation of the scheme, did not appear to the author to go far enough. An owner should also be entitled to compensation on revocation of a scheme for any loss of income he might have sustained by reason of having been precluded from dealing with the land in any manner he thought fit during the time the scheme was in force. He could conceive it possible that restrictions might be imposed by a scheme which would make it impossible for an owner to deal with his land, and if the scheme was ultimately revoked, an owner should in such case be entitled to receive from the authority compensation in respect of the loss that he had incurred by having been forced to hold up his land. Local authorities could purchase by agreement or compulsorily any land comprised in a scheme. The procedure for compulsory purchase was the same as in Part I. of the Act. It was not quite clear in what way the authority could deal with the land. The general provisions prescribed by the Board include "dealing with or disposal of land acquired by the responsible authority or by a local authority"; these might possibly authorise the authority to lay out streets and deal with the land for building purposes. In all cases where the Board were authorised to determine matters they could act as arbitrators or otherwise. If they determined the matter as arbitrators the provisions of the Regulation of Railways Act, 1868, and its amendments were to be applicable. It appeared to be open to the Board under this part of the Act to appoint an arbitrator to act on their behalf.

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* A summary of a paper on the "Housing and Town Planning Act," read by Mr. John Willmot before the Surveyors' Institution on Monday evening last, Mr. A. R. Stenning, president, in the chair.

In conclusion, he said the terms of the town planning part of the Act were so very general that it would be difficult to predict how it would work, but he had no doubt that it would form the basis of a good working arrangement between landowners and local authorities, and it was with that hope that he commended it to the members of the Institution, feeling sure that they were in agreement with anything which would conduce to the better laying out and development of land, as being to the advantage of those for whom they act and of the community at large.

Mr. H. Chatfeild Clarke, who proposed a formal vote of thanks to the author of the paper, said they were extremely indebted to Mr. Willmot, one of their busiest members practising in the Midlands, for presenting the Act to them in such a simplified form. The Act seemed to be well framed, and proper provision appeared to be made for compensation and for appeal on the various points which might arise.

Mr. Richard Fowler (Birmingham) seconded the motion.

The President said the Council had arranged that the discussion of that evening's paper and the one contributed by Mr. Davidge should take place on January 24. Mr. William Woodward had promised to open the discussion on that occasion, and Mr. Speaight and Mr. H. V. Lanchester, who would also take part in it, had offered to illustrate their remarks with lantern diagrams and views.

Messrs. Raymond Unwin, H. Griffin, and W. F. Craies supported the vote of thanks, which was passed by acclamation, and the meeting then terminated.

## THE ACADEMY WINTER EXHIBITION.

The fierce and rather undignified controversy that was raised last year when the Royal Academy Winter Exhibition was given up to the modern works purchased for the collection of Mr. George McCulloch made it inevitable that the exhibition for 1910 should follow conventional lines. There is no reason for supposing that the Council ever intended to make last year's departure from tradition the first of a successive series of similar exhibitions. The conditions were peculiar and justified an unusual course of action. Many bitter and justifiable complaints are constantly raised as to the glorification of dead painters at the expense of living ones. Consequently, the example of a wealthy collector, who showed his love of art not by the purchase of a few world-famous Old Masters, but by the encouragement of his contemporaries alone, called for some recognition. The exhibition also served to show the purchasing public that their patronage of living artists could be something in the nature of a profitable investment. Mr. McCulloch was not, of course, an adventurous patron, for his taste was strictly orthodox and he was probably helped by the advice of artists who had little sympathy with experiments. But in its own way his collection admirably reflected the work of an all-important section of modern painting.

The latest exhibition at Burlington House must serve as a reassurance to any who feared that the winter shows would degenerate from their usual high standard. In the first five galleries and in the Water-Colour Room there ıré nearly two hundred works by old masters and leceased masters of the British school; while in the Black-and-White Room there hangs a small collection of ɔictures by the late Mr. E. J. Gregory, R.A.

Giovanni di Paolo, the painter of the first picture on he walls, has been called a master of the "marvellous mongrel style," which overspread the School of Sienna when in the fifteenth century realism began to assimilate with the qualities which had made the school famous. In his *Annunciation* the artist was at some pains to introluce into the foreground rabbits playing in foliage, in the eft of three horizontal divisions, and in the right St. Joseph warming his feet and hands at a fire. The centre shows an open Gothic loggia with the Virgin and the ngel both with arms humbly crossed on their breasts. Presumably the *Madonna de' Talenti*, which hangs next, s an earlier production of the school, although in many haracteristics it might be a comparatively modern nasterpiece. It lacks altogether that crowded composition which marks most of the early works. The panel is exclusively occupied by the Virgin and Child seated on great throne. Round her golden nimbus is embossed ' Ave Maria Gratia Plena," and in her cloak is a jewel. The dignity of the whole seems to be heightened by the Child in her lap, who is, it should be observed, not nude, out lightly clad. This picture offers an interesting conrast with the circular *Virgin and Child* by Botticini near oy. Here as much, or more, space is given to the andscape setting as to the figures. The former was erhaps the contribution of an assistant, who sought to btain dignity by representing the country as sown with niniature castles. Sandro Botticelli, like del Sarto, s represented by only one picture—the Virgin seated nder a marble Renaissance canopy, with the Child tanding in her lap. There is an irresistible loveliness n Andrea del Sarto's *Virgin and Child and St. John*, n which all the artist's genius was lavished on the three mall figures. There is no landscape background to disract attention, as in some of his works, for the beautiful oung Madonna stands out against a gilded setting. nother industrious artist whose skill can be gauged by nly a single work, and in this instance it is a mediocre ne, is Leonardo da Vinci.

In Gallery II. are the three works ascribed to Titian. The first is a *Portrait of Sansovino*. This sculptor-archiect first went to Venice after the sack of Rome in 1527. Titian, who was ten years his senior, had for a long ime been accepted as the greatest painter in Venice. Sansovino, according to Vasari, "in his age had an xceedingly venerable appearance; with his beautiful hite beard he still retained the carriage of his youth; e was strong and healthy even to his ninety-third year, nd could see the smallest object at whatever distance, ithout glasses, even then." His recorded affection for andsome clothes is not emphasised in the portrait, for e wears a suit of solemn black. Titian may have elieved that his subject's facial expression was of greater nportance than his white beard; the general effect is at of a shrewd, busy, and business-like architect whose houlders have become rounded by unremitting toil at the rawing-board. Although he is leaning with his right and on a table, the painter did not take advantage of ne opportunity to introduce any roll of plans or statuette s indication of his dual calling. It is a long stride from itian to Murillo. By the Spanish master there are vo large canvasses; the first is *St. Augustine of Hippo*, kneeling figure of the bishop, and the other is *The aralytic*. We believe that the latter was one of the ght large pictures painted by Murillo for the Hospital St. George in Seville about 1670, and the majority of hich are now dispersed. The handling is strong and mple; one half of the foreground is occupied by the upght figures of Christ and three disciples with the paratic at their feet; to the right is seen the architectural irroundings of the Pool at Bethesda. Murillo was inebted to Velasquez for much help in his days of ruggle, but the three examples of the latter artist sugest that the younger man became the better painter. In *ur Lady of the Immaculate Conception* Velasquez had a great theme. Pope Paul VI. in 1617 publicly affirmed the doctrine which was one of the most discussed by theologians. The artist may have felt little enthusiasm in the matter; a homely Virgin clad in purple and blue drapery stands sadly on a crescent moon, with a diadem of twelve stars, in accordance with the well-known passage in the Apocalypse of St. John (chap. xii. 6). Another of the pictures shows St. John writing the Apocalypse in a wood. The third—*The Steward*—might have been painted to suit the whim of some wealthy patron, for the subject could have offered little attraction to such an artist.

The Water-Colour Room contains a curious assortment of pictures, chiefly of the Dutch and Flemish Schools. There are four single portraits by Franz Hals; the first was a sitter after his own heart, *Hille-Bobbe of Haarlem*, a half-length of a coarse old fishwife hugging a drinking vessel with both hands. The remaining three are of more respectable types. Among other artists represented in this room are Gerard Dow, Albert Cuyp (3), Nicholas Maes (3), Teniers (3), and Holbein (2).

Gallery No. III. is chiefly occupied with the more modern works of the Winter Exhibition. They include four characteristic portraits by Gainsborough and one of his landscapes; prominent among the former is the full-length of Sir Charles Morgan, Bart., in the grand manner. Neither in *Sheerness* nor the *Harbour of Dieppe* is Turner seen at his best; but his Venetian scene is a more creditable specimen. The full-length of *William II. of Orange* as a boy is as remarkable for the fact that it was painted by Albert Cuyp when he was no more than eighteen years old as for its vivid presentment of the youthful royal sportsman. The *Portrait Group* by Jordaens is accepted as one of the greatest works by that unequal master, and as even bearing favourable comparison with any picture by Rubens, his fellow pupil and life-long friend. The composition with its two figures contains many features seen in his other portraits. Of a very different character, though no less typical, is his *The King of Twelfth Night*, which is marred by the exultant grossness of all the thirteen figures. There are six portraits by Vandyke, none of which are of particular importance. His large equestrian portrait of *Duke d'Aremberg* bears the closest possible resemblance to the same artist's equestrian portrait of Charles I. in our National Gallery. Three out of the twelve portraits by Sir Joshua Reynolds are in Gallery III. The claim that "his children have all the artless graces of childhood, his women are lovely," is fully borne out by the first two, and that "his men are endowed with dignity" is also seen by the bust portrait of himself. Some of the nine, however, appear lacking in vigour, if it is not heresy to say so. There are two anonymous portraits by Rubens, together with an extraordinary *Landscape with Boar Hunt*, which must surely be one of the many works to which the artist's name is erroneously attached.

Of Sir Henry Raeburn, R.A., a critic wrote many years ago, "His portraits were distinguished by great breadth, and marked by great individuality of character and truthful expression, but they were simply portraits and do not possess any high interest as works of art." With the latter opinion there will probably be few visitors in agreement; the six portraits contributed are certainly splendid portraits above everything else, but they are much besides, and it is difficult to know which to admire most. The three Romneys include a large canvas, *The Beaumont Family*, containing five full-length life-sized portraits in an uncompromising direct fashion.

It is curious to step out of the Water-Colour Room, filled with Flemish and Dutch masters, into the Black-and-White Room, which is given up to oil-paintings and water-colour drawings by the late Mr. E. J. Gregory. The abrupt transition is not fair to the deceased Academician, whose modernity is made to look "cheap." The pictures are in themselves of the pleasantest, with their wholesome frankly English spirit and joyousness. Yet they are overpowered by the weight of the remainder of the pictures in this Winter Exhibition. It has been said that Mr. Gregory lacked artistic personality and was seriously handicapped by his facile dexterity in adopting the moods and manners of his contemporaries. The present small collection seems certainly too much in the nature of a charming picture-book designed to while away an hour of idleness and painted under the spell of happy thoughts.

## NORWEGIAN v. BRITISH GRANITE.

THE following correspondence is interesting and instructive:—

GRANITE.

Sir,—After reading your letters to a working man on the political situation, just published in book form, I am writing you as a worker interested in the British granite industry with regard to one point contained in your letter No. VI. on page 47.

You state that "the contractors could not obtain Cornish granite of proper quality and in sufficient quantity to complete work in time. Contractors submitted samples of Norwegian granite, which was substituted for Cornish. The value of the British granite was 760*l*., of foreign 76,500*l*."

I submit to you, sir, that the delay was caused chiefly by the officials at first taking too literal an interpretation of the specification with regard to workmanship on the Cornish stone, and considerable time was lost until the matter was finally adjusted to enable the granite merchants to proceed with the supply.

Now, with regard to the 760*l*. worth of British granite.

The quantity of granite supplied from the home quarries was close on 100,000 feet cube. If the Admiralty got it for the amount mentioned I am sure the taxpayers can congratulate themselves; but no, sir, I fear there must be some mistake, because the foreign granite did not cost 76,500*l*., nor anything like it.

As I feel quite sure this is a clerical error, I point it out to you so that you may have an opportunity of correcting it publicly, seeing the amount of publicity which has been accorded your letter.

I trust you will give this your prompt attention.—I am, sir, your obedient servant,

(Signed) JAMES CLAYTON.

To Dr. Macnamara, M.P., House of Commons, Westminster, S.W.

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Dear Sir,—In reply to your letter of the 22nd ult., with reference to the granite used in the construction of Chatham Dock, I write to say that the statement which I made in my pamphlet, though necessarily compressed, was based on information obtained from official sources. Permission to use Norwegian granite in place of Cornish was granted because the contractors satisfied the Admiralty that, in consequence of the exceptional activity in the Cornish granite trade at that time, it was not possible to obtain from the Cornish quarries a supply adequate in quality and quantity to complete the work within the specified time. I would remind you that at this time large orders were on hand for Admiralty works at Gibraltar, Keyham, and Dover, and also for the Great Western Railway Company and other big companies.

The impossibility of obtaining the necessary supply in time was confirmed by one of the principal Scotch quarry-owners, who was consulted on the subject.

The decision to allow the use of foreign granite was not dependent on the officials taking, as you suggest, too literal an interpretation of the specification with regard to workmanship.

I do not know what authority you have for the statement that 100,000 cubic feet of British granite were supplied to Chatham.—Very faithfully yours,

(Signed) T. J. MACNAMARA.

To James Clayton, Esq.

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Sir,—I thank you very much for your courteous letter of the 10th inst. *re* granite supply at Chatham Dock.

You ask me what authority I have for the statement that nearly 100,000 cubic feet of British granite were supplied to Chatham.

In reply to this I have to say that my figures are obtained direct from the Cornish granite merchants who undertook the supply.

They show that they supplied 89,990 cubic feet from British sources. This quantity was obtained principally from their Cornish quarries, a small portion only being sent from Aberdeen.

The total quantity required in the new dock was 262,440 cubic feet, so that the balance left to be obtained from Norway was 172,450 cubic feet.

Putting your relative values against the granite merchants' quantities, the result appears as under:—

British granite, 89,990 cube feet supplied, value 760*l*.; Scandinavian granite, 172,450 cube feet supplied, value 76,500*l*.

Seeing that it is an accepted fact that British granite is quite unable to compete in price with Norwegian, then you will understand why I am writing you to point out this discrepancy.

The publication of your letter and booklet containing this statement is most damaging to the British granite merchants, and I feel sure that with the actual facts before you, you will not hesitate to admit the injustice done to an industry which is suffering intensely from foreign competition.

Thanking you in anticipation for the favour of your further attention to this matter.—I am, sir, your obedient servant,

(Signed) JAMES CLAYTON.

To Dr. Macnamara, M.P.

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Sir,—In reference to my letter to you dated December 15 last, *re* granite supply at Chatham Dock, I shall esteem it a favour if you will let me know whether you are yet able t substantiate your figures giving the relative values of British and Norwegian granite used in the Chatham Dock.

I may say that a very considerable amount of political capital is being made out of your statement, particularly i the West of England, to show that the home quarries entirel failed in the supply for the granite, and I hesitate to mak any correction until you have had ample opportunity o justifying or amending your figures in face of my last letter.

Thanking you in anticipation for a prompt reply, an wishing you the compliments of the season.—I am, sir, you obedient servant,

(Signed) JAMES CLAYTON.

To Dr. Macnamara, M.P.

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Dear Sir,—In reply to your letter of the 15th ult., I hop I need not say that nothing was further from my intentio when I wrote my little book than to make any statement calcu lated to damage the British granite or any other Britis industry, and I could wish that Tariff Reformers were alway as careful.

As I have already told you, the contractors for Chatha Dock represented that it would be impossible at that tim to supply the granite required from British sources withi the specified time. This was confirmed both by Cornish an Scotch granite merchants, and the contractor was allowed t substitute foreign granite for British granite, provided tha it complied with the Admiralty specification. As foreig granite was at that time cheaper than British—although th difference in price was not as considerable as it has sin become—no further inquiries were made as to the source fro which the granite was obtained after the contractor had bee given leave to supplement his British supplies from foreig sources, and the Admiralty merely took the necessary ste to insure that all the granite used in the construction of th dock came up to the required standard as regards durabilit and finish.

I have, however, had further inquiry made, and I no find that though the contractor was given this option, he w eventually able to obtain, roughly, a third of the grani required from British sources.—Very faithfully yours,

(Signed) T. J. MACNAMARA.

To James Clayton, Esq.

## THE PROGRESS OF DESIGN IN PAPERHANGINGS.*

ALTHOUGH paperstaining is found to be a recognis trade in France in 1586, yet it was not until 1692 th we find any record of English paperhangings, and that was consequence of the granting of a patent to William Bayl of that date in the time of William and Mary. To quo from the "Encyclopædia Britannica":—"Wallpapers d not come into common use in Europe till the eighteenth ce tury, though they appear to have been used much earlier the Chinese. A few rare examples exist in England whi may be as early as the sixteenth century; there are imitatio generally in flock of the fine old Florentine and Genoese c velvets, and hence the style of the design in no way sho the date of the wallpaper, the same traditional patterns being reproduced for many years with little or no change."

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* Abstract of a paper read on Monday, the 9th inst., by Metford Warner (of Jeffreys & Co.) before the Incorpora Institute of British Decorators.

The designs used for the earliest English paperhangings were largely influenced by the velvets and damasks of an earlier period and also by the importation of the Chinese paperhangings during the reign of Queen Anne, 1702-1714. At that time the manufacture of paperhangings was so well established that they had to contribute to the revenue by the imposed duty of 1¾*d.* per square yard.

It was with a view of introducing paperhangings of a different type to this that a Mr. Jackson, of Battersea, who was printing wallpapers at that period, urged the reproduction of the most celebrated classic subjects, statues and landscapes, in preference to imitations of Chinese papers. Instead of flowing patterns covering the wall, his designs were pictures, landscapes, architectural scenes or statues treated on panels with plain paper or painting between. They were all in the worst possible taste, and yet were offered as a great improvement on the Chinese papers. Mr. Jackson says that by the use of his paperhangings, "The person who cannot purchase the statues themselves may have these prints in their places, and thus effectually show his taste. 'Tis the choice and not the price which discovers the true taste of the possessor and thus, the Apollo Belvedere, the Medicean Venus, or the Dying Gladiator, may be disposed of in niches or surrounded with a mosaic work in imitation of frames, or with festoons and garlands of flowers, with great taste and elegance, or, if preferred, landscapes after the most famous masters may be introduced into the paper." Notwithstanding all Mr. Jackson's efforts to counteract the tendency to Chinese design, it continued to have a great influence.

A Mr. Taylor, who at that time was an eminent manufacturer of paperhangings and who visited France, reported on his return that he found the French paperhangings very inferior to our own both as to execution and beauty of design. We had at that time an extensive export trade in paperhangings with America and other foreign parts.

The influence of Chinese ornament was very marked, both in France and England, and the practice of sending out costly presents to China from both nations and receiving valuable gifts in return fostered the fashion. Among such was the Gobelin tapestry which Louis XV. sent out with a deputation to the Emperor of China, and was retaken by the French in the looting of the "Summer Palace" in 1860. In London there is at the present time one of the finest examples of Chinese paperhangings. It was brought over to England by Lord Macartney, the first British Ambassador to China, who returned in 1792 and presented this set of painted papers to Mr. Coutts, the banker. They remained as the decoration of the drawing-room at Coutts' Bank, in the Strand, until 1905, when they were taken down and placed in their new buildings opposite Charing Cross station. The space covered by the decoration is about 20 feet by 30 feet and 12 feet high.

In 1786 George F. Echardts established a manufactory at Chelsea, where he produced works of great excellence. Only part of the design was given by printing, the rest put in by artists specially retained assisted by more than fifty young girls.

Simultaneously with the establishment of the Chelsea works, Mr. Sherringham commenced the business which he so long carried on with remarkable taste, skill and energy in Great Marlborough Street. He is described by Mr. Contan as the Wedgwood of paper-stainers. He secured the talent of some admirable foreign artists (La Briere, Boileau, Louis and Rosetti) and infused the highest beauty and grace into the artistic department of his trade. He was the first to produce what are known as Arabesque papers with any degree of excellence.

Mr. Digby Wyatt also says, "We are induced to believe that the establishment of Mr. Harwood, an equally eminent promoter of this manufacture, might be dated even earlier than the two to which we have just referred," and speaks of him as a man who possessed a large capital, and purchased a business which had for some time been established at Chelsea.

The excavations of Pompeii, commencing in 1755, had a great influence on the designs of the latter part of the eighteenth century, influencing the later designs of Louis XV. and more or less the whole of Louis XVI. period in France, and finding expression in England in the architecture of Robert Adam and the furniture of Chippendale.

Towards the end of the eighteenth century the French began to excel in this particular branch of art, which with us had fallen on barren ground. Their manufacture was encouraged by the French Government, and Mr. Zuber of Reinheim (the celebrated French paperstainer) said, in a lecture which he delivered in Mulhausen, in 1851, "Towards the end of the last century, about 1780, the manufacture passed from England into France." At this time the importation of paperhangings into England was entirely prohibited. (It was not permitted until 1825.) And our paperhangings were also subjected to a tax so onerously applied that before the adoption of continuous paper each piece composed of twenty-four sheets received on its back twenty-four stamps with two more to mark the two ends, the duty on each piece being 1*s.* 4*d.* in addition to the tax on the paper itself, and an annual payment of 20*l.* for a licence.

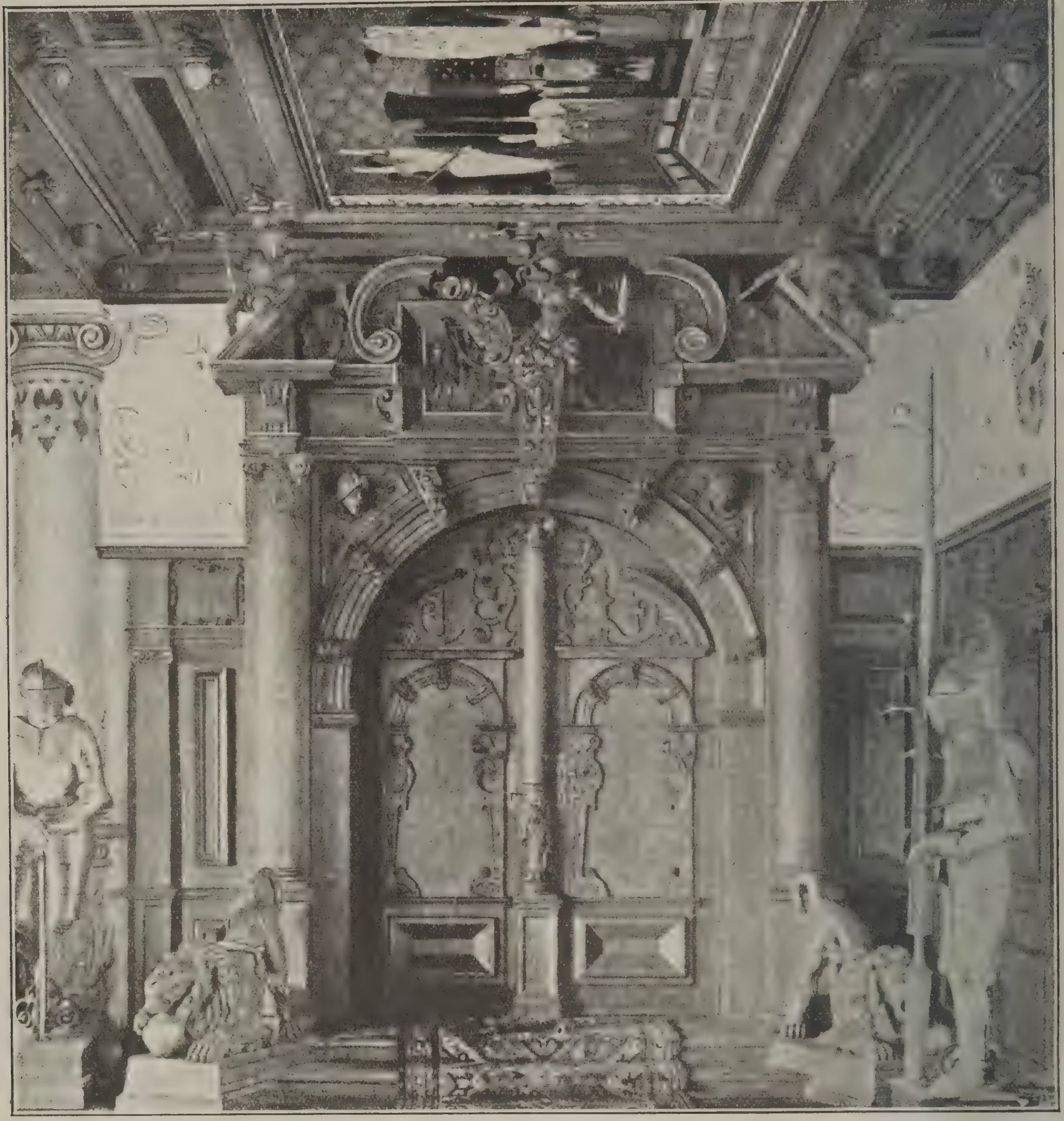
Although English manufacturers were thus reaping the pecuniary benefit by the prohibition of foreign wallpapers, yet they were in a great measure unaware of the progress which which was being made in France, and they continued to strike after the effect of silks and other materials rather than strike out in a new direction. That paperhangings were in vogue and that they were used in the highest class of decoration, is evident from notices of them which have come down to us from that period. Shelley in a letter dated 1811, speaks of his "quiet back sitting room, its walls papered with trellis, vine leaves and clustering grapes: an abode of enchantment."

In the year 1825 the prohibition of foreign wallpapers was removed and a duty of 1*s.* per square yard equal to seven francs per French piece was established. Mr. Zuber (the French paperstainer) who paid a visit to England says:—"My curiosity nevertheless led me to make an excursion to England for the purpose of seeing if it were possible to import at this rate of duty, and to my astonishment I found I was able to enter into considerable transactions. 'You beat us completely' was what I continually heard from the English dealers on showing our products. This state of things continued till 1834. Our importations at last pushed the English manufacturers into the improvement of their work, and at this latter date the English Government reduced the customs duty to one-half and took off at the same time the stamp duty on English-made paperhangings. Our business was not in any way augmented, but the English manufacture made such progress that in 1846 Sir Robert Peel made a new reduction of the import duty by two-thirds, *i.e.*, reduced it to 2*d.* a yard or about one franc per piece. A violent shock to the English manufacture followed, but a salutary effect was quickly produced on it. During the first year of the new regulations our importations doubled themselves; they however soon fell off again, but not before this heavy competition had impelled the English manufacturers to such exertions that now, with a duty of one-sixth of that of 1825, we find a difficulty in introducing merchandise to the same amount as then."

In 1837 commenced the printing of paperhangings by machinery, which was eventually to revolutionise the trade. It was introduced by Evans & Fisher, of Alder Mills, Tamworth, who, as paper-makers, commenced to make the paper in endless coils of some 2,000 yards in length, and then use it for their own printing, the designs used being formed almost entirely of simple lines. A marked change, however, came in design in 1843 and following years, when Augustus Welby Pugin designed the celebrated wallpapers for the Houses of Parliament, for Mr. Crace, the blocks of which are still in use and are now in the possession of Messrs. Cowtan. The Great Exhibition took place in 1851, and among the valuable records of it are the illustrated volumes of Sir M. Digby Wyatt, and in looking at these illustrations one cannot but be struck with the extent to which French design had been adopted by English manufacturers. It was also between 1851 and 1861 that Messrs. Scott Cuthbertson (who had acquired Hingcliffe's business) introduced the "raised flocks." As the effect obtained by flock entirely depends on flat treatment, the designs of Augustus Welby Pugin were peculiarly suited for the purpose. In 1854 Owen Jones brought out his grammar of "Ornament," and although he did not design for paperhangings until some years later, yet its publication had a marked influence on designers. In 1861 the duty on paper itself was finally abolished and the customs entirely removed, English and French manufacturers being placed (in England) on the same footing. A tremendous impetus was given to the machine-printed papers, which were already largely in demand, and with it came the call for designs especially adapted for machine printing.

The year 1862 is noticeable as the date when William Morris commenced to design his wallpapers, and his firm of Morris, Marshall, Faukner & Co. exhibited these with furniture and tapestries in one class, and stained-glass windows in another, in the 1862 Exhibition. A medal was bestowed on the firm for their work in either class. The "Trellis" was the first wallpaper he designed, and the "Daisy" the first published. The first series of Morris wallpapers, the design-

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Der Profanbau.*

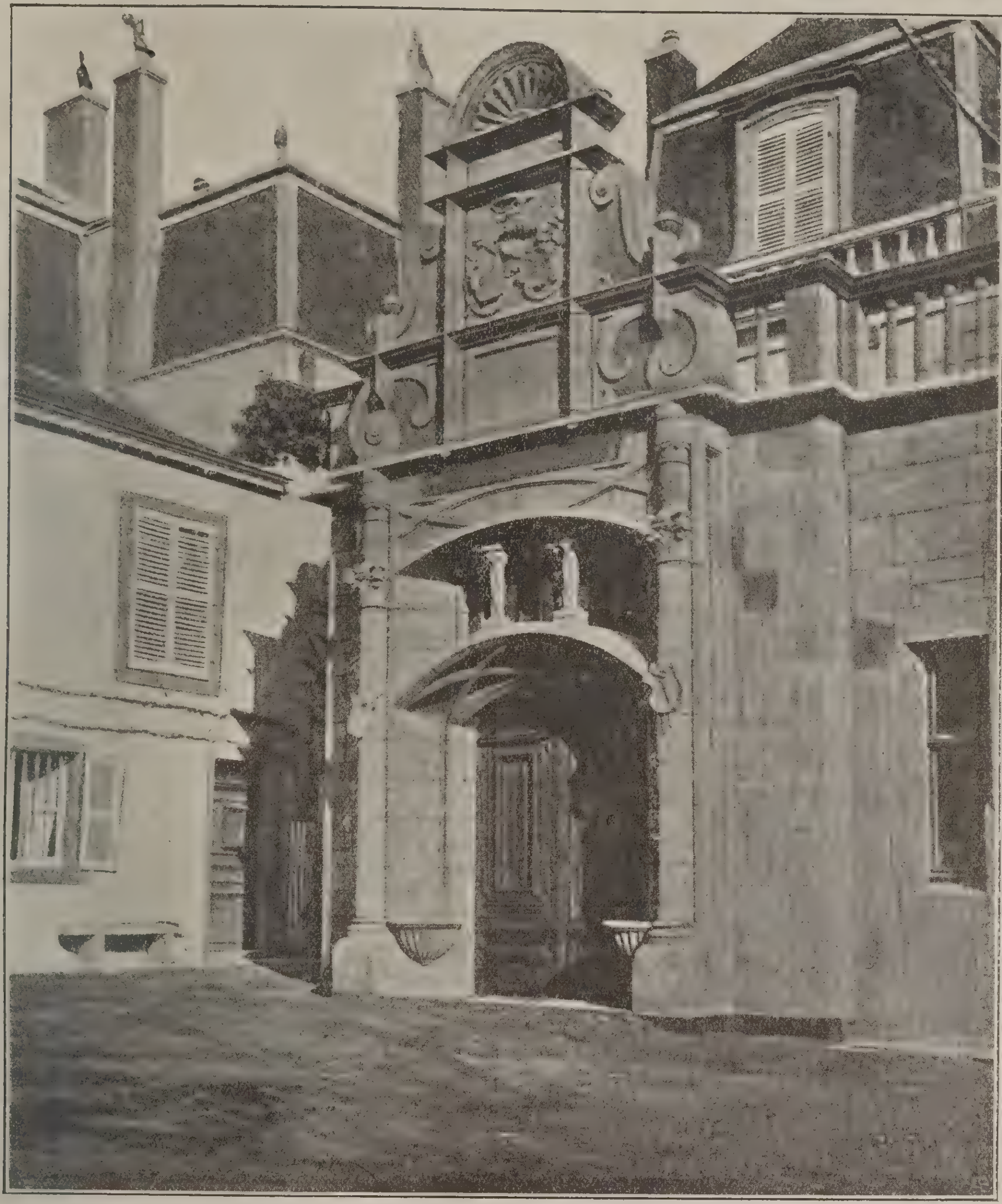
ENTRANCE TO CHAPEL, ALTENBURG CASTLE.—Professor BODO EBHARDT, Architect.

ing of which went on rapidly for several years (he designed between seventy and eighty wallpapers) "culminated in the favourite and beautiful pattern known as the 'Pomegranate.'" It was the blue colouring of this paper which Messrs Morris used as a background to their exhibit of furniture at the Franco-British Exhibition of 1908. Owen Jones' services as a designer and art adviser were now retained by Messrs. Jackson & Graham, and it was under his control that shortly before 1865, they completed the decoration of the Viceroy's palace at Cairo. For this work he designed a most elaborate series of paperhangings for walls, ceilings, friezes, dados and borders, based on Persian ornament, the colouring employed being blue, red, yellow, gold and white; the white and gold being used either for the grounds or for the lines falling between the colours. The character of design was such an entirely new departure in paperhangings that Jeffrey & Co. decided to show the French that English paperstainers were no longer under their influence, and in the Paris Exhibition of 1867 their chief exhibit was the Pilaster decoration by Owen Jones. The Owen Jones wallpapers appealed to a limited circle, but they were too severe in character to meet the public taste, and it was left to Dr. Dresser, who immediately followed in the wake of Owen Jones or worked on his lines, to give a greater popularity to the flat treatment of ornamenting. He not only went to Persia and the near East for his inspiration, but largely drew on Japan, whose wares were being more largely imported. He was in a great measure responsible for that unfortunate style of design in which, instead of a flower being treated in all the beauty of its growth, is ruthlessly dissected and has its parts laid bare and worked up into a pattern.

In Charles L. Eastlake's book "Hints on Household Taste in Furniture, Upholstery and other Details," the first edition of which was published in 1868, he acknowledged the valuable designs which had been prepared since Pugin by architects and artists, and produced by such houses as Woollams and Crace, yet he adds "The British public are, as a body, utterly incapable of distinguishing good from bad design and have not time to inquire into principles. But let customers once become accustomed to the sight of good forms and judicious combinations of colours and we may one day aspire to the formation of a national taste. To attain this end, however, the manufacturers (if any are to be found so disinterested) must first inform themselves of the best sources from which good designs may be originally obtained, because at present they seem to be derived from the very worst." It had its effect, and when Eastlake brought out the fourth edition, 1878, he was glad to find that his hope ten years previous had

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Der Profanbau.*

A PORTAL, LANDONVILLERS CASTLE.—Professor BODO EBHARDT, Architect.

been in a good measure realised, and among the illustrations was that of his own "Solanum" wallpaper which created quite a demand for that character of design. Also, in 1868, B. J. Talbot published his book on Gothic forms applied to furniture, decorations, &c., and eight years after he brought but another edition with illustrations of furniture, silk hangngs, and wallpaper decorations. His designs for wallpapers were numerous and the copies still greater. Many of Talbot's designs were influenced by Japanese art—and in fact Anglo-Japanese became at that time quite the fashion, finding expression in the furniture and wallpapers designed by E. W. Godwin, and the celebrated Peacock Room which J. McNeill Whistler decorated for Leyland. The influence of Japanese ornament was as marked at this period, both on French and English design, as the Chinese had been in the time of Queen Anne.

The Philadelphia Exhibition of 1876 was the occasion of further demonstration that English designers were holding their own against the world, and the award of the juries which accompanied the medal given to Jeffreys & Co. for the decoration specially designed by Walter Crane, stated it was given for "great excellence and chastity of design, connected with xceedingly harmonious colouring; altogether a most artistic xhibit of the large decorative effect which is possible with his material in the hands of a clever designer." English aperstainers made a good show at the Paris International Exhibition of 1878, both Messrs. Woollams, and Jeffreys & Co. exhibiting; and a gold medal was awarded to the latter for their exhibit, the chief feature of which was the embossed leather paper known as "Peacocks Amorini" by W. Crane, and the "Sunflower," in flocks, by B. J. Talbot. Both of these had a marked influence on the wallpapers of that day and since, the various versions of the Sunflower being used for all classes of materials.

It was not left to manufacturers to be alone the pioneers in improvement in wallpaper designs, but early in the 'eighties Messrs. Simpson brought out a special book from designs by Lewis F. Day, which obtained much favour with many leading architects and decorators, not merely from the originality of the designs, but from the success which attended their use as decorations. Previous to the "Simpson" patterns L. F. Day, in 1879, had brought out his "Instances of Accessory Art." It was at the same time that Mr. L. A. Shuffrey brought out his private patterns, which, again, not merely were a success in themselves, but had their effect on the designer.

In 1888 the Arts and Crafts Exhibition Society held their first exhibition. It was composed of artists, designers and craftsmen, who felt that up to that time the decorative artist and handicraftsman had little opportunity of displaying their work in the same sense as the pictorial artist, and they asked manufacturers who were striving after more artistic work to unite with them in forming an exhibition of designs and manufactured goods. The result was that many artists whose work would not otherwise have become known got into touch both with the public and the manufacturer, and both France and Germany recognised its service in stimulating originality (not whim or eccentricity) in design.

It was at the Arts and Crafts Exhibition of 1889 that C. F. A. Voysey made a large exhibit of designs for all classes of work, and there can be no question that his designs have had a great influence, not merely on wallpapers, but on carpets and fabrics of all kinds. At the Paris Exhibition in the same year a further satisfactory display was made of English wallpapers, including W. Crane's "Peacock Garden," and again the jurors recognised the progress made by awarding a gold medal. Anyone who recalls the pictures displayed at that exhibition will recall how satisfactory they looked against the rich flock paper designed by L. F. Day and coloured under the direction of Sir Frederick Leighton compared with the foreign galleries where the walls were blank and uninteresting.

These International Exhibitions held in London and Paris, and the Arts and Crafts Exhibitions led the French designer to feel that the time had come when he too must make a move forward. Up to this period he had been content to design in the classic French styles. The desire for something new brought about the "Art Nouveau" which was rampant in the Continental courts in the Paris Exhibition of 1900. The foreigner looked to the English exhibits for something emphatically new, and found it in the exhibit of Messrs. Essex, whose wallpapers were principally, if not entirely from Mr. Voysey's designs, and in Messrs. Jeffreys & Co.'s exhibit of "The Rose Bush," by Walter Crane, whose treatment of the subject sprang from his starting from nature but treating it as an ornamentist. The French designer took the motif from the English but so infused it with his own expression that he entirely lost any sense of nature from which the English design sprang, and in consequence produced in many cases a meaningless squirm. One of the results of this Paris exhibition has been a demand for less pattern and more plain surface. A little squirm goes a long way, and to some no squirm at all is more satisfactory still, and hence came the demand for little or no pattern. What could be better than a mere spot and a little scratch? So what need for the skilled designer and the enterprising manufacturer?

In Mr. Morris's lecture on the Lesser Arts of Life, he says, "Whatever you have in your rooms think first of the walls, for they are that which makes your house and home, and if you don't make some sacrifice in their favour you will find your chambers have a kind of makeshift, lodging-house look about them however rich and handsome your movables may be." It is just this lodging-house, uninteresting effect which is brought about where walls are treated with simple plain tints; it may be that they are pleasing in the first instance, but when the unavoidable finger-marks and rubs come and the pictures or prints get a little awry, the eye seeks in vain for the compensation which comes from a surface broken by pattern and colour such as can be found in a well-considered wallpaper.

Mr. LEWIS F. DAY said he had listened to the paper with very great interest as coming from one who not only was interested in his work but who knew all about it. To a great many people more than half the information given would be new. Although Mr. Warner had talked about the history of wallpaper, he had been rather quiet as to what he had done himself. Yet there was no one who had done so much for wallpaper manufacture as Mr. Warner; if it had not been for him English wallpapers would have never reached their present high position. The ultimate effect of the artist's design was partly dependent on the man into whose hands it fell. Many artists, who did the very best they could, had the mortification of seeing their work murdered in reproduction. But no one had ever grumbled at their treatment by Mr. Warner, and Mr. Day added that the most successful reproductions of his own designs had been those made by that firm. Mr. Warner might indeed be called the Wedgwood of the wallpaper world. No doubt everybody would like to have their walls painted by artists, but 999 people out of 1,000 had to accept wallpaper as a substitute; it was certainly the cheapest way of getting a comfortable effect. With regard to pattern, it should be noted that it is easiest to get beautiful tones in broken colour. Mr. Day, reverting to the lecturer, added Mr. Warner was the first to induce artists who had not previously done anything of the sort to design wallpapers for him. Among the instances given were Godwin, Burges and Walter Crane.

Mr. SHUFFREY expressed the opinion that a wallpaper is most suitably designed and is most satisfactory in a room when it takes the form of a background. That principle had of late been lost sight of; the designers had attempted too much and only produced a restless feeling which killed whatever was placed near it. Architects had notably lost all interest in wallpapers. It was to be hoped there would soon be a return to the two or three most suitable colours.

Mr. J. D. CRACE, the chairman, in concluding the brief discussion, said that no one possessed a more thorough knowledge of paper hangings than Mr. Warner, who had followed his occupation far beyond its mere hand to mouth demands. The earliest paper stainers were chiefly employed in producing papers with small patterns for the lining of books. An advertisement in the *Postman* 1702, showed that the sale of hangings had then become a business in London. In 1770 some 13,242*l*. was paid to the Government as duty on 255,731 pieces. Sixty years later the number of pieces had increased to 1,222,783; while in 1874 one single firm produced 12,000,000 pieces.

A vote of thanks was then passed.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has issued a special number on "Apartment Houses," or residential flats as we should call them here, which, with an extensive collection of plans and views, gives a thorough insight into what is being done to-day in the United States in this class of dwelling, in which American architects have had far more experience than is obtainable in England.

*La Construction Moderne* has given us illustrations of the premiated façades in Paris for the year 1907. Nos. 44 and 46 Rue Bassano, by MM. Le Nevé et d'Hont; No. 124 Avenue Victor Hugo, by M. P. Humbert; No. 110 Boulevard Raspail, by M. Eugène Chifflot; No. 13 Rue de la Paix, by M. Auburtin. In its review of Old Paris, our contemporary now deals with the Gobelins quarter.

*Berliner Architekturwelt* gives, with an explanatory article, many illustrations of the work of the education department of the Applied Art Museum in Berlin. Other illustrations are principally of designs for public buildings by Berlin architects.

*Der Architekt* has an interesting article on garden-craft and landscape-gardening. The principal designs illustrated this month are for a museum in Innsbruck, by Heinrich Ried, and a pilgrims' church and cloister at Maria Wald. There are also several examples of old work principally from Graz.

*Arquitectura y Construccion* devotes its illustrations and much of its text to the exhibition of the Province of Valencia, its chosen example of modern Spanish architecture. A review of the history of Spanish Christian architecture in the Middle Ages, by Don Vicente Lamperez y Romea, gives a list of the buildings referred to by the author.

*Stone* illustrates the Chautuqua County Court House, Mayville, N.Y., of which Mr. Wm. J. Beardsley is the architect, and the accepted design for New York's new municipa office building by Messrs. McKim, Mead & White, which is a fine example of the skyscraper or tower type of modern American building.

*Construction* gives us a capital series of illustrations of the modern architecture of Winnipeg, "the gateway to the granary of the British Empire"; of Regina, the "model city of the West"; of Saskatoon; of Edmonton the "gateway to the North"; of Calgary, which, taken altogether, enable us to form a clear conception of what architects are doing in the dominion of Canada.

The *Engineering Record* describes the method of driving what are called "pedestal" piles, a novel and useful device for soft ground, in which the bottom of the pile, which is o concrete, is expanded into a bulb.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

**Llandaff.**

SIR,—The following anecdote may perhaps prove of interest in connection with the See of Llandaff:—

When Protector Somerset, in the middle of the sixteent century, thought to build himself a Palace in Westminster he laid sacrilegious hands on churches and seized also episcopal residences, one of which was the palace of the Bishop o Llandaff, situated on part of the coveted site.

The witty Bishop remarked that as the Protector had taken the land, he (the Prelate) was only Bishop of hal ('aff).

He had the consolation of his wit; a consolation denied to the other mulcted bishops, whose titles did not lend themselves perhaps to the perpetration of puns.—Faithfully yours

January 10, 1910. PERCY L. MARKS.

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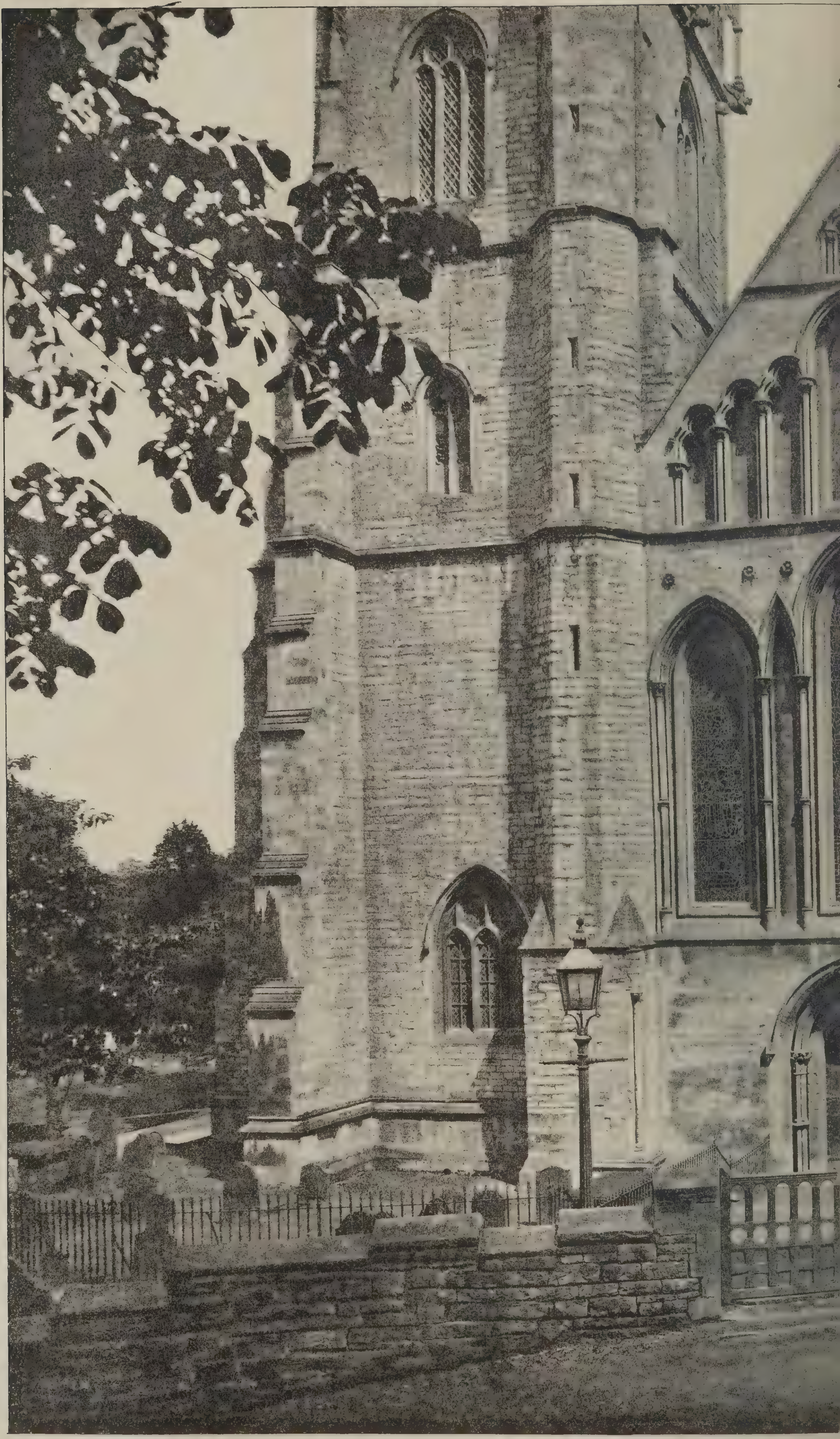

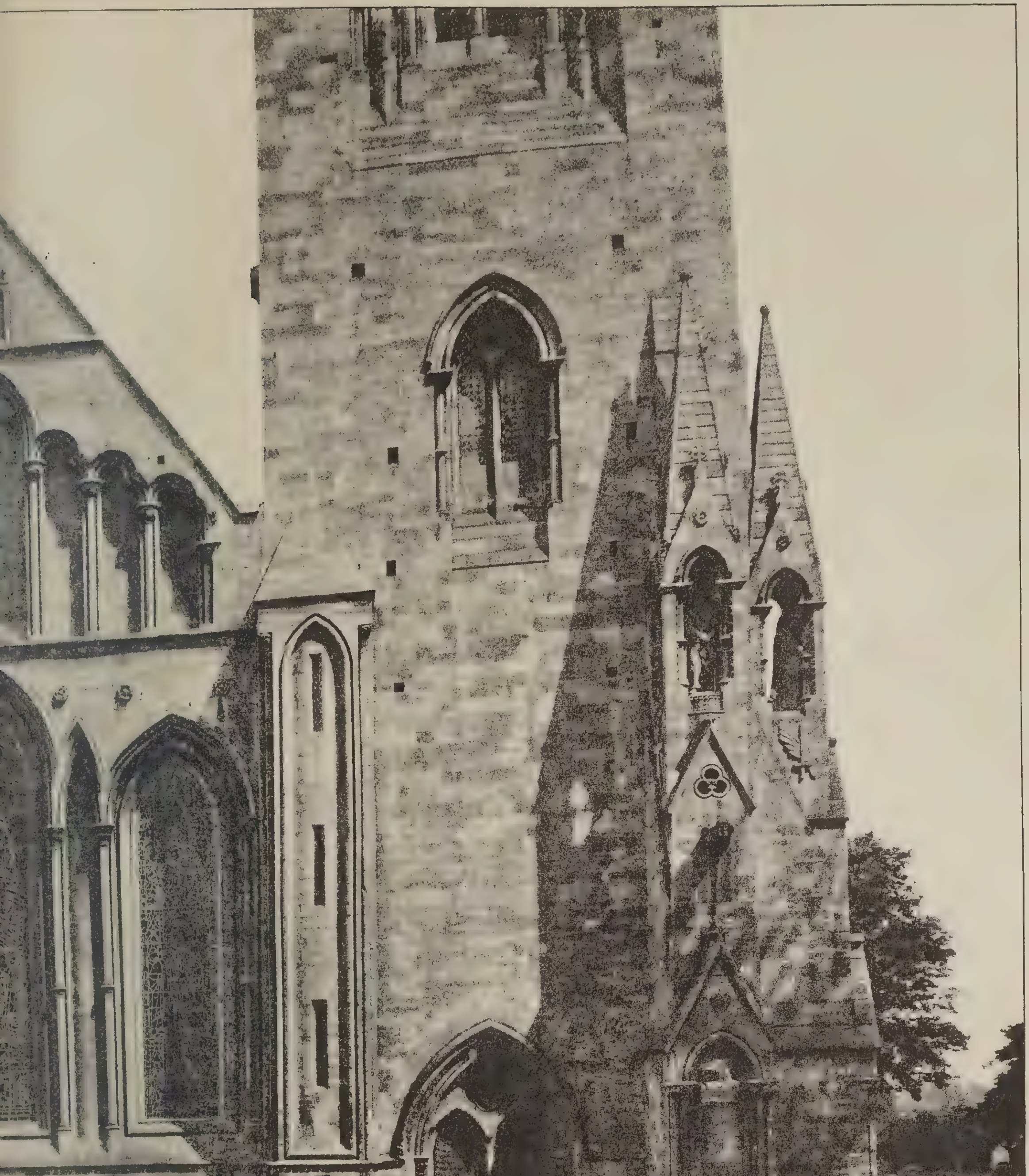

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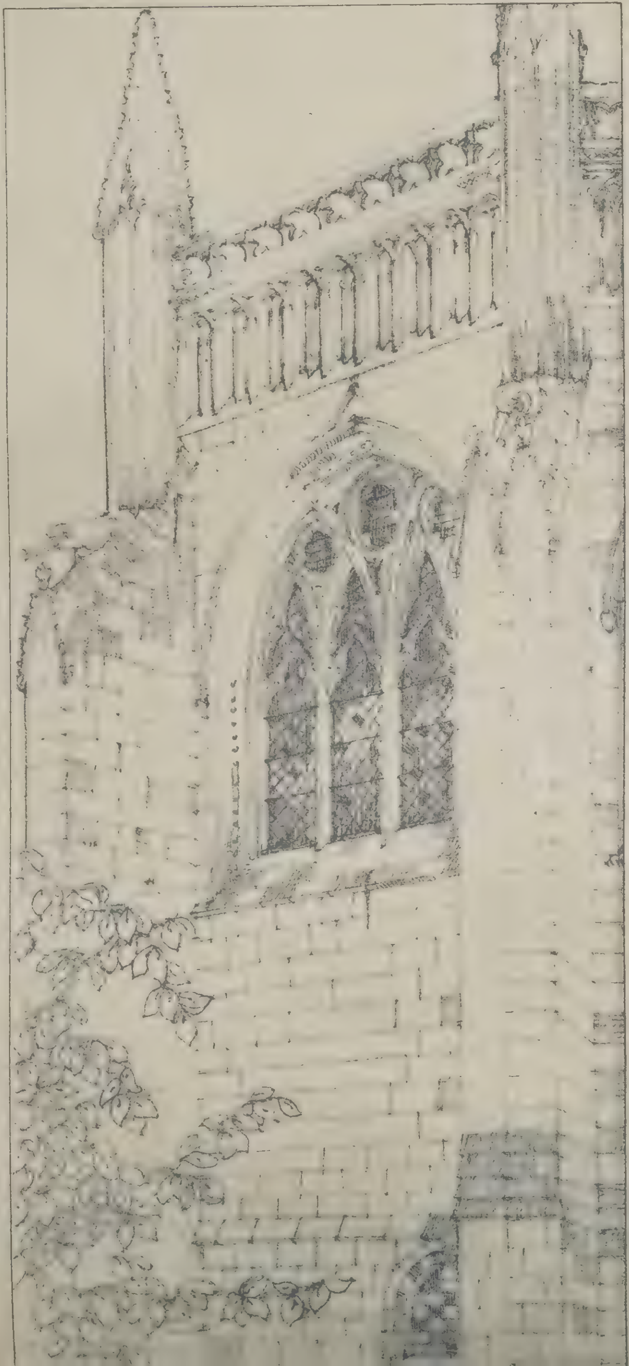
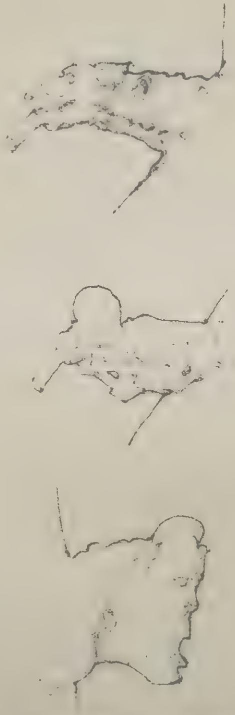
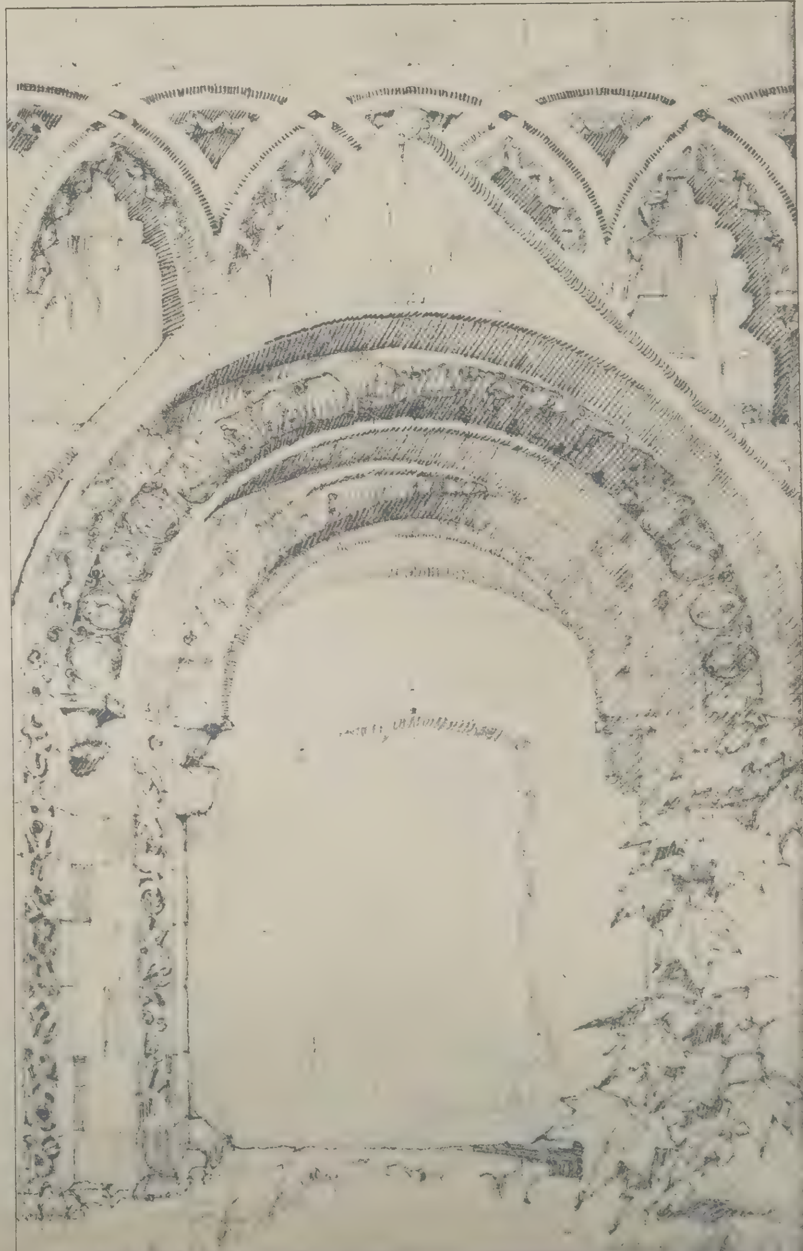
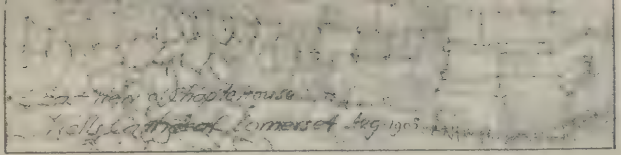




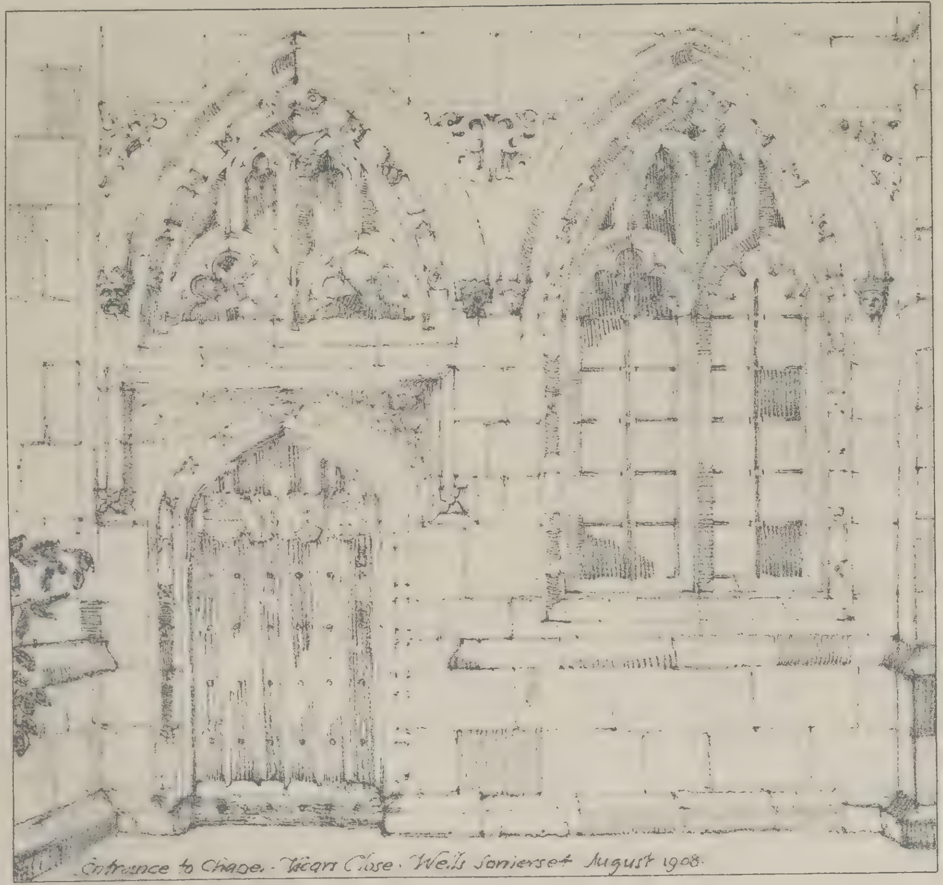
Gurgoyles. Chapter House
Wells Cathedral Somerset



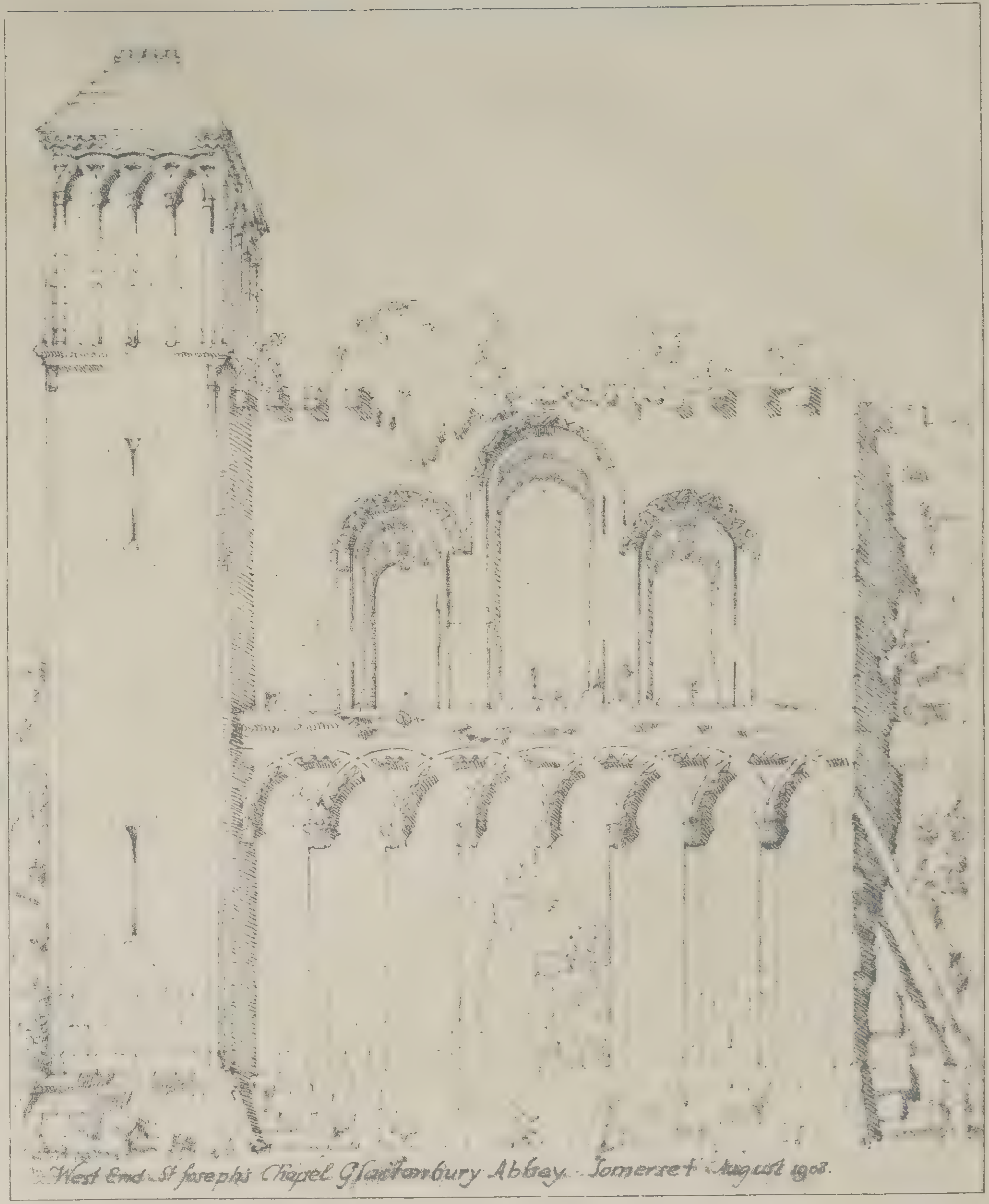
North Doorway. St Joseph's Chapel Glastonbury Abbey. Somerset



East View of Chapter House
Wells Cathedral Somerset Aug 1908



Entrance to Chapel. Vicars Close. Wells Somerset August 1908.



West End. St Joseph's Chapel Glastonbury Abbey. Somerset August 1908.

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# SKETCHES IN SOMERSET.

By JOHN TH WESTBYE, Architect

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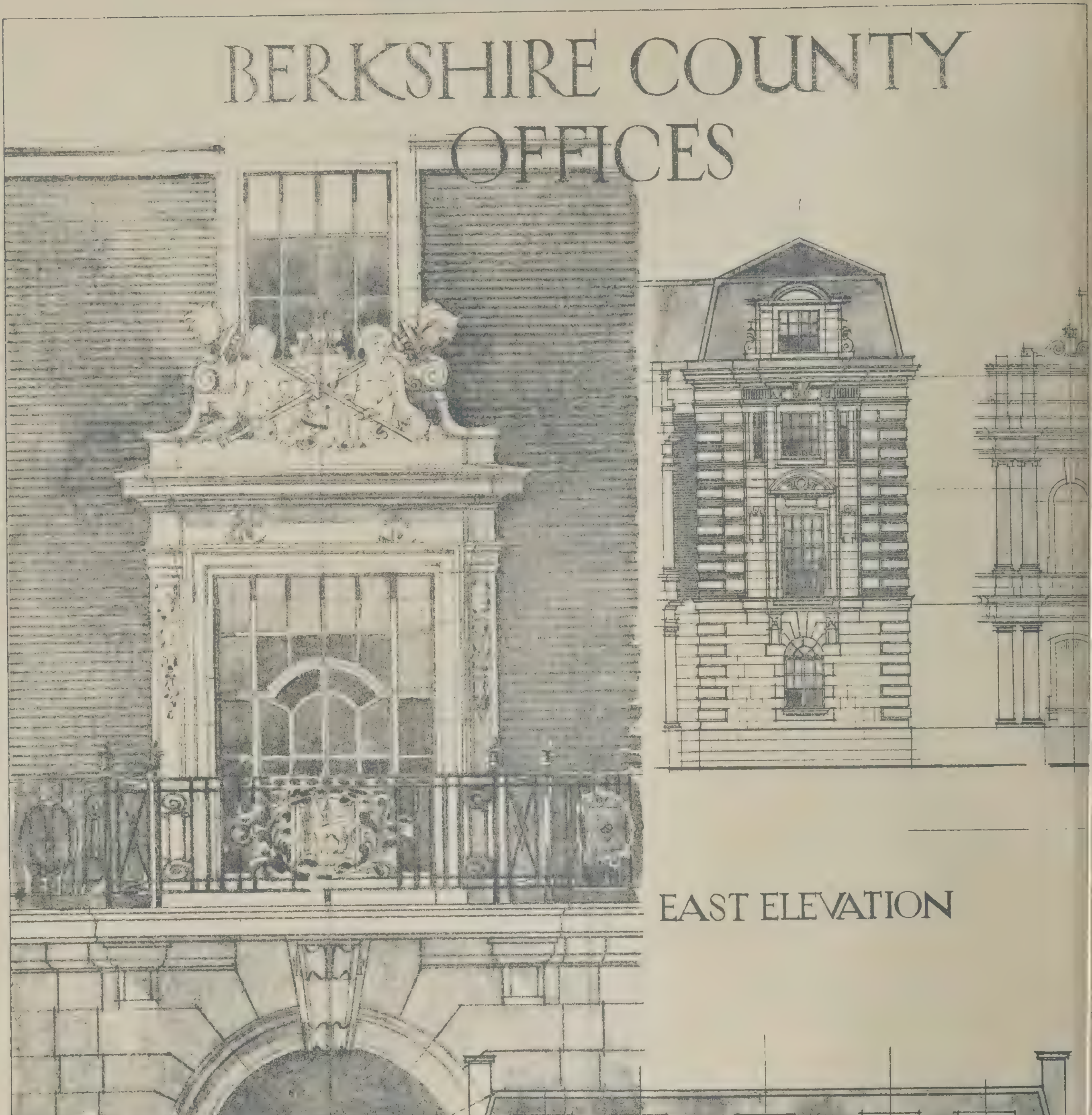

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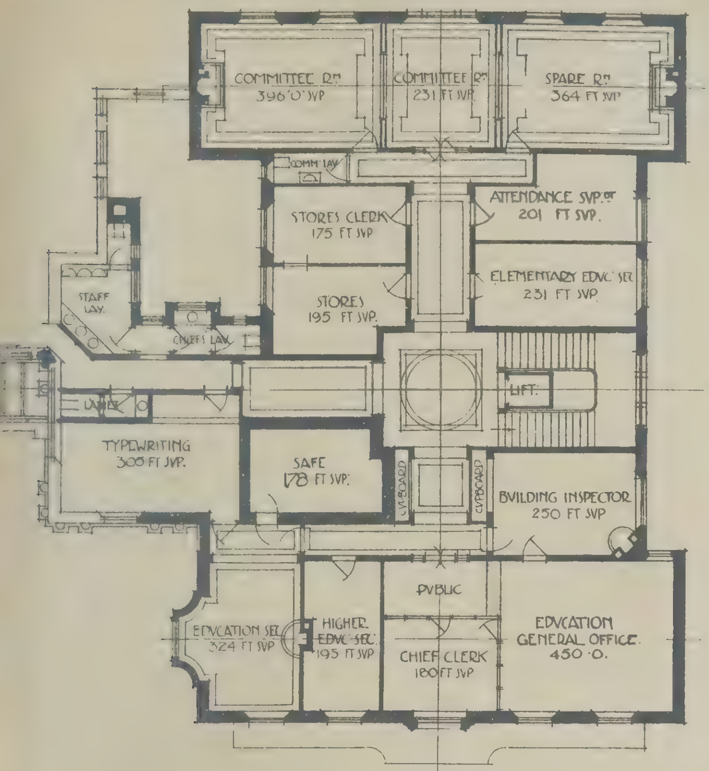
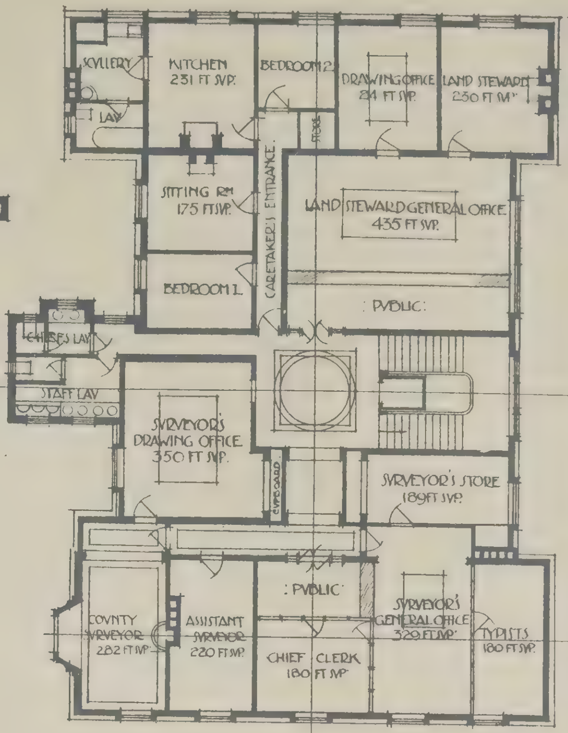
Competition Design for Berkshire County Council Offices, Reading.

Messrs. T. LAWRENCE DALE and A. G. HORSNELL, Joint Architects.



## FIRST FLOOR

AREA OF OFFICES 3048
COMMITTEE ROOMS 627.
TOTAL AREA 3675
[EXCLUSIVE OF CORRIDORS, LAVATORIES AND PVBLIC SPACES]


SCVLLERY
LAV
KITCHEN 231 FT SVP.
BEDROOM 2
DRAWING OFFICE 214 FT SVP.
LAND STEWARD 230 FT SVP
SITTING Rm 175 FT SVP.
CARETAKER'S ENTRANCE
LAND STEWARD GENERAL OFFICE 435 FT SVP.
BEDROOM 1
PVBLIC
CHIEFS LAV
STAFF LAV
SVRVEYOR'S DRAWING OFFICE 350 FT SVP.
CVPBOARD
CVPBOARD
SVRVEYOR'S STORE 189 FT SVP.
PVBLIC
COVNTY SVRVEYOR 282 FT SVP
ASSISTANT SVRVEYOR 220 FT SVP
CHIEF CLERK 180 FT SVP
SVRVEYOR'S GENERAL OFFICE 320 FT SVP
TYPISTS 180 FT SVP

## THIRD FLOOR

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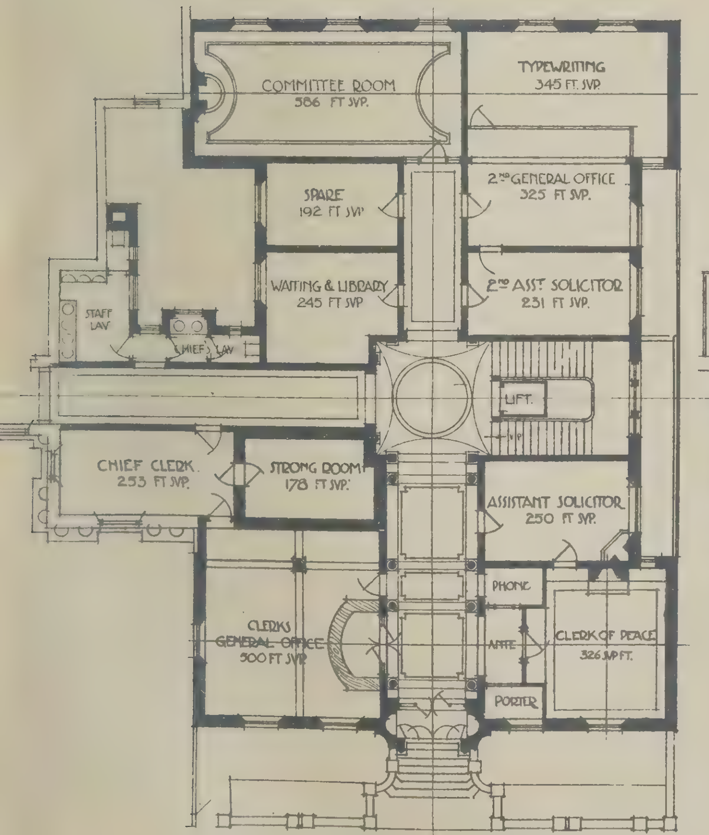
CARETAKER'S HOVSE 908
TOTAL AREA 3517
[NOTE AS FIRST FLOOR]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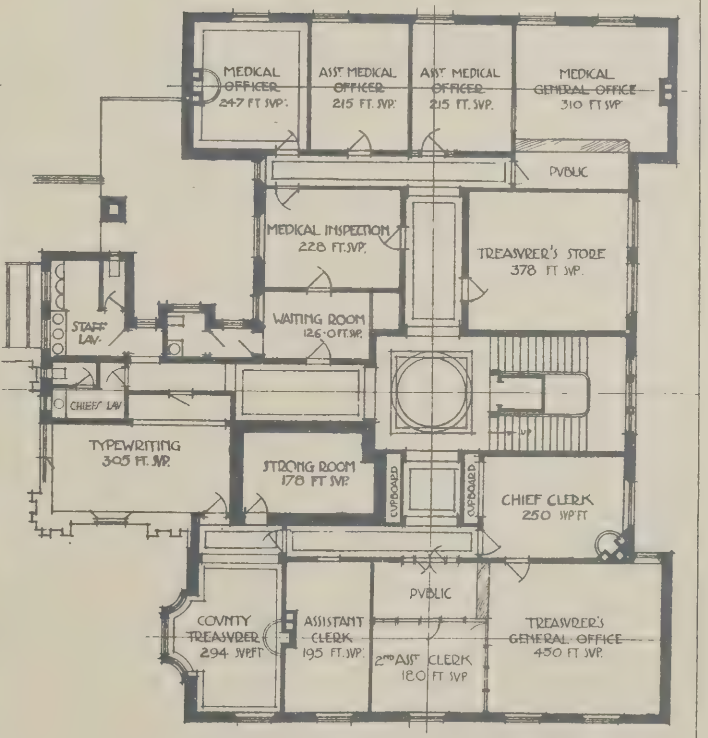
TYPEWRITING 345 FT SVP.
SPARE 192 FT SVP
2nd GENERAL OFFICE 325 FT SVP.
WAITING & LIBRARY 245 FT SVP
2nd ASST SOLICITOR 231 FT SVP.
STAFF LAV
CHIEFS LAV
LIFT
CHIEF CLERK 253 FT SVP.
STRONG ROOM 178 FT SVP.
ASSISTANT SOLICITOR 250 FT SVP.
PHONE
ANTE
PORTER
CLERKS GENERAL OFFICE 500 FT SVP
CLERK OF PEACE 326 SVP FT.

## GROUND FLOOR

AREA OF OFFICES 2845
COMMITTEE ROOM 586
TOTAL AREA 3431
[NOTE AS FIRST FLOOR]


MEDICAL OFFICER 247 FT SVP.
ASST MEDICAL OFFICER 215 FT SVP.
ASST MEDICAL OFFICER 215 FT SVP.
MEDICAL GENERAL OFFICE 310 FT SVP
PVBLIC
MEDICAL INSPECTION 228 FT SVP.
TREASVRER'S STORE 378 FT SVP.
STAFF LAV.
WAITING ROOM 126 FT SVP.
CHIEFS LAV
TYPEWRITING 305 FT SVP.
STRONG ROOM 178 FT SVP
CVPBOARD
CVPBOARD
CHIEF CLERK 250 SVP FT
PVBLIC
COVNTY TREASVRER 294 SVP FT
ASSISTANT CLERK 195 FT SVP.
2nd ASST CLERK 180 FT SVP
TREASVRER'S GENERAL OFFICE 450 FT SVP.

## SECOND FLOOR

AREA OF OFFICES 3578
[NOTE AS FIRST FLOOR]

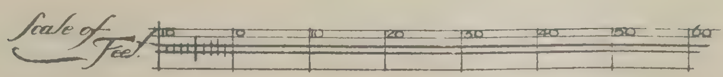


PHOTO-LITHO, SPRAGUE & CO L 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

Messrs. T. LAWRENCE DALE and A. G. HORSNELL, Joint Architects

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# The Architect.

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## FORTHCOMING EVENTS.

*Monday, January* 24.

Liverpool Architectural Society : Paper on "The City Beautiful; or, Liverpool Compared with Cities Old and Modern," by Mr. Edmund Rathbone.

Royal Society of Arts : Cantor Lecture (2), "Textile Ornamentation," by Mr. Alan S. Cole, C.B.

Surveyors' Institution : The adjourned discussion on Mr. Davidge's paper, "Town Planning Systems," and Mr. John Willmot's paper on "The Housing, Town Planning, &c., Act, 1909," will be continued. Mr. William Woodward will open the discussion.

*Tuesday, January* 25.

Guild of Architects' Assistants : Annual general meeting at the Bedford Head Hotel, W. Mr. R. Weir Schultz, chairman.

*Wednesday, January* 26.

Carpenters' Company : Paper on "The Carpenter's Craft," by Mr. Banister F. Fletcher, F.R.I.B.A.

Manchester Society of Architects : Paper on "Truro," by Professor S. H. Capper, M.A., A.R.I.B.A., R.C.A.

*Thursday, January* 27.

Leeds and Yorkshire Architectural Society : Paper on "The Elizabethan House as Illustrated by Contemporary Architectural Drawings," by Mr. J. A. Gotch, F.S.A., F.R.I.B.A.

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## STUDENTS' DRAWINGS AT THE ROYAL INSTITUTE.

THE annual display of students' work for the year may be said in a sentence to be excellent in studies, but poor in design. The measured drawings, the PUGIN and the OWEN JONES are well contested with high-class work, whilst the SOANE, the TITE and the GRISSELL show a generally low standard of achievement.

For the Institute silver medal and ten guineas offered for measured drawings of ancient buildings in the United Kingdom a very fine set of drawings of the Wellington Monument in St. Paul's Cathedral by Mr. JAMES WHITELAW takes the first position justly, by reason of its thoroughness and excellence of draughtsmanship. Scarcely less excellent, if by reason of the greater magnitude of the subjects less complete, are the drawings to which the second and third positions have been awarded, illustrating respectively the Hôtel Carnavalet, Paris, by Mr. CYRIL DE FAREY, and the Palazzo della Gran Guardia Vecchia, Verona, by Mr. HERBERT J. ROWSE. The drawings of the west portico of St. Paul's Cathedral, submitted under motto "Ad Metam Contendo," are good, and so are those of FROMAND's Chantry and Cloisters at Winchester College, which are particularly interesting from the aberration of the cloister width, which looks as if it must have been intentional and worthy of the attention of Mr. GOODYEAR as an example of "refinement." But really there are no bad drawings amongst the dozen sets, though some are better than others, and some are evidence rather of painstaking labour than of artistic appreciation.

A design for a Shakespeare Memorial Theatre has proved an attractive subject for the Soane Medallion, and at a first glance the seventeen sets of drawings submitted make a brave show, but on a closer inspection one finds many weaknesses, chiefly of plan. It would seem that several of the competitors assumed that the requirements of a theatre were of quite secondary importance in a Shakespeare Memorial, and that the audience would not go to hear or to see or even to be comfortable, but that the memorial would be quite effective if it never opened its doors. Another fallacy that seems to have caught competitors is that to win the blue ribbon of British architectural students in design it is necessary to come as near being a Frenchman as possible, and if one has not had the advantage of instruction in the Ecole des Beaux-Arts to make believe to have had it. We hope that the fact that Mr. ADRIAN BERRINGTON, who for the third year in succession takes second place, was a student of the Liverpool University School of Architecture, where they study drawing, as in Paris, will not lead more Britishers to imitate, at a distance, what they have not truly learnt. The Parisian style of drawing has its charms, but it is not the only style, and it is not necessarily architecture.

Mr. ALICK G. D. HORSNELL, the winner, has had a fairly easy victory. His design expresses all parts of the house. The stage, with the great height necessary for modern scene-shifting, soars above everything and forms a background for the auditorium, which with a low-pitched dome itself rises clear of the approaches and accessories. In planning, Mr. HORSNELL divides his house into parterre and one tier, an arrangement we do not think any English manager would approve unless he were sufficiently subsidised to be independent of his box office. Around the auditorium is a wide promenade, with two lounges on each floor, which from a practical point of view is the best feature of his plan. His detail is of the modern French type with which the competition work of one or two exponents has made us familiar.

Mr. BERRINGTON's design is not so happily expressive, as an immense false roof over the auditorium, though it makes for unity of the building, destroys the relation of the parts. Here we have stalls, boxes, balcony and gallery which would please better the financial views of a manager. The detail is a version of modern French treatment of the Doric order, and in feeling is rather too monumental in the necropolitan sense to be suitable for a theatre.

"Caliban" has a design that rightly expresses the parts of the house, and in planning provides stalls, boxes one tier, a big foyer and two salons, but his exterior lacks dignity in the entrance front, which is too much cut up and has doors too small for architectural effect. His detail is based on that of a well-known English theatrical architect of the day before yesterday.

"Mafie" does not trouble about planning, and produces a rather wild design based upon modern French detail.

"Horseshoe" (device), No. 6, has a dignified exterior, though cold and not enthusing. The planning of the auditorium with a broken curve to the corridor is bad, and the balcony level is impossible.

"Touchstone" has a dome of overpowering dimensions that dwarfs the stage, and his conception is a *tour de force* rather than a rational and expressive design. The tinted perspective is a good piece of drawing.

"Star and Crescent on Shield" (device), No. 3, has an almost rectangular auditorium, with boxes on the sides that are apparently designed for the occupants to see the people in the house rather than the stage. The author attempts to be French, but indifferent figure drawing spoils the effect.

"Forward" has a strange idea of a balcony, and apparently thinks that a theatre should consist mainly of a grand vestibule, salons and salle de (*sic*) fêtes.

"Sunshine and Air" bases his design soundly on modern French work and shows it in good drawing, but in planning the auditorium seems to think that the chief desire of the audience is to look into the wings. He also has an exaggerated idea of the importance of lounges, whilst his notion of a balcony is quite impossible.

"Puck" has had a bad attack of angles in arranging his plan, and his detail and drawing are both very poor attempts at being French.

"Red Seal" has adopted a concert-hall gallery plan for his upper tier, and not having provided much lounge space inside, makes up with immense covered promenade halls outside open to the air. As these are about 64 feet by 42 feet without internal supports, he must have great faith in the possibilities of steel girders, or perhaps reinforced concrete. He is not content with a dome, but, wishing to be truly monumental, tops it with a huge spire, a rival of the Mausoleum of Halicarnassus.

"L'Espoir" has a very original idea of theatre planning, with a shallow auditorium less than a semicircle, a quite horizontal stage, and a hidden orchestra. He seems to imagine that a Shakespearean theatre would be given up to Wagnerian trilogies, and has given each box a private sitting-room with a fireplace. Drawing and detail are worthy of a plan more reasonably like a theatre.

"Nunquam Dormio" shows a more intimate knowledge of practical theatre planning than anyone else, but does not know so much of architectural design and has not had time to finish his drawings.

"Yellow Disk" (device), No. 14, would be French if he could, but does not understand the planning of seats in a theatre.

The Owen Jones Studentship has attracted only three competitors, but their quality is high. Mr. W. O. Miller sends a very fine set of beautiful drawings that are also careful studies of Italian work from Rome, Assisi, Florence, Siena, and the Victoria and Albert Museum, from which latter he has had the good sense and courage to study modern work as exemplified in the green dining-room.

Mr. H. R. Wilkinson supplements excellent studies from the Palazzo Vecchio, Florence, and a Parisian room of the latter half of the eighteenth century by Rousseau de la Rottiere, Langrenee dit le Jeune, Clodion and Couthiere, with a study of decoration for a church as designed by himself for the sanctuary of Santa Chiara in the Victoria and Albert Museum, which in its colour scheme is not quite a success. Mr. Wilkinson shows that he can copy pictures, and his detail drawing of mosaic from the west front of Orvieto Cathedral is marvellous in its realism.

Mr. J. Harold Gibbons bases his claim on the studentship chiefly on careful study of the colour-work of Westminster Abbey and an internal perspective showing how he thinks the church was decorated, with which we cannot quite agree, as the colour tone he adopts is not that we should expect to find in English work till very late in the fifteenth century. Mr. Gibbons sends also some nice sketches of fragments of English colour decoration, but his Continental work is limited to water-colour sketches of architecture in Normandy, and nowadays to win the Owen Jones Italian study is imperative.

The Pugin Studentship is excellently well contested, and Mr. H. Hubert Fraser wins, we fancy, by the impression his work creates that it is a study of architecture, and not a carefully prepared series of drawings made *ad hoc* for the prize. His measured work includes studies of colour, without which a proper comprehension of English mediæval architecture is impossible.

Mr. D. J. Chisholm has sent in much excellent measured work, but his perspective drawings are rather hard and mechanical in character, and he has not devoted attention to colour.

Mr. J. B. F. Cowper shows good drawings, including a big perspective study of St. Patrick's Church, Patrington, Yorks, which is a frankly diagrammatic architectural drawing, but his work is just the opposite of Mr. Fraser's, and conveys the idea that it has been done for the sake of the Pugin Studentship, and not for the sake of architectural study.

Mr. J. L. Berry has done good work, but this year it does not happen to be the best, although he has studied good examples, having measured the Bell Harry tower at Canterbury and Warmington Church, and made a fine study of the west front of Wells.

Mr. W. T. Benslyn also sends good drawings, his principal contribution being the measurement of the rood-screen of Kenton Church, South Devon. Dore Abbey is good, but Top Farm, Willersey, is hardly the kind of work that pays in competition for the Pugin. Mr. Benslyn's perspective drawing in pencil is rather woolly and confused, neither effective nor informative.

Mr. Frank Hearne has shown commendable industry in measuring, but fails in his freehand drawing.

The competitors for the Tite Prize have, we think, been rather hardly treated in being set a very difficult subject and then snubbed by the withholding of the prize, because none of them reached an ideal but indeterminate standard known only to the caprice of the judges. We admit that the designs are not a super-excellent set, but it seems to us to be very questionable policy for the Institute to withhold prizes that are supposed to be given to encourage the younger members of the profession, and it is absurd to expect a genius to appear every year at the age to which the competition is limited. Our view is that each prize offered should be given to the best man that competes, however low the standard attained. We wonder how many of the judges would like to make such a set of drawings as is required for the Tite Prize for the paltry sum of 30*l*. Oh! we must not forget that there is a certificate as well.

Mr. Wm. A. Robb gets ten guineas and a certificate for a design that is quite decent, even if it is a little claptrap and the drawing a bit queer in perspective; whilst Mr. Wm. Friskin and Mr. A. R. Barker, who receive certificates—without cash—and the authors of "Apex," "Woman's Head" (device), No. 3, and "Palladio" ought in our opinion to have been each rewarded with the 30*l*., failing a stronger competitor, if it were only that they might be induced to do something better in future after spending the money in travel and study in Italy.

The Arthur Cates Prize appears to be losing the character the founder intended, that of encouraging a higher standard in the "testimonies" submitted by candidates for the final examination, as it is evidently to be won not by the "testimonies" but by the additional work accompanying them. This, no doubt, is excellent, Mr. C. D. Carus-Wilson, the winner, showing some very effective and clever drawings of Trinity College Library, and each of his four competitors putting in also capital work.

The Grissell Gold Medal has found but two competitors, but both good, and the unsuccessful one showing the most originality both in his construction and his architectural treatment of the reinforced concrete church with vault.

## NOTES AND COMMENTS.

The Royal Academy of Arts has discovered that there is an architect named Ernest George, and has done itself the honour of electing him as an Associate, by the tardiness of which action it has incontestably proved its incompetence to recognise in the slightest degree what is comprehended in the Art of Architecture.

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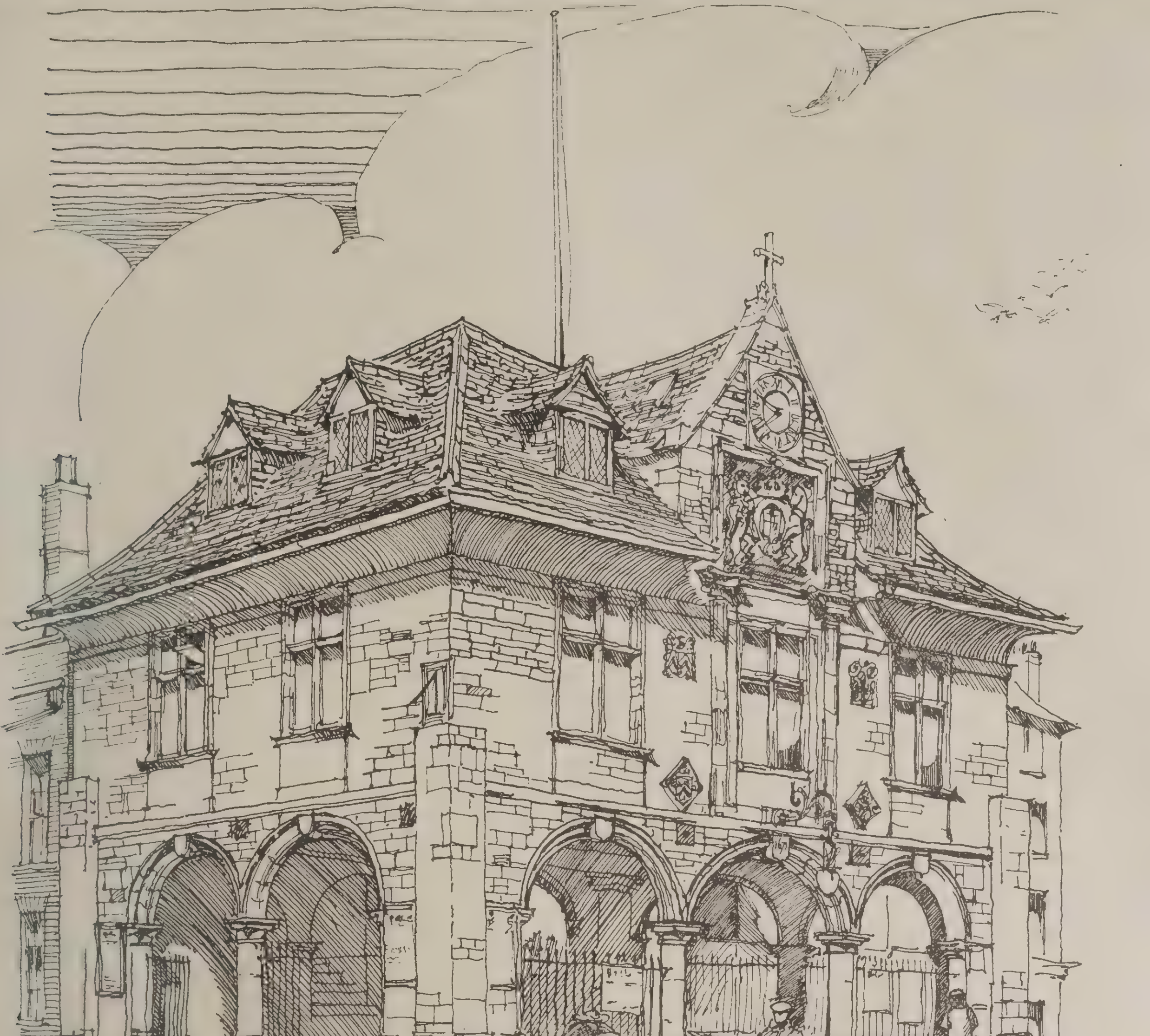
Burslem Municipal Buildings have at last got a fair start. A ratepayers' meeting has been held and approved the scheme and the expenditure, and the Town Council has resolved, "That the plans for the new public buildings proposed to be erected in Wedgwood Place, prepared by Messrs. Russell & Cooper, be approved, and that the



Drawn by LESLIE WILKINSON, A.R.I.B.A.

tender of Messrs. ARNOLD & SON, of Doncaster, amounting to 24,918*l.*, for the erection of such buildings, be accepted, and that all the necessary contracts be entered into." Of course, the opposition was active to the last, but was in a minority, though by a very small margin.

STOKE-ON-TRENT is also to have carried out the proposed extension of its town hall, the Town Council having resolved to accept the tender of Messrs. WILCOCK & Co., of Wolverhampton, to carry out the amended plans of Messrs. WALLIS & BOWDEN for the sum of 25,791*l.*

The Duke of Fife has presented to the Burgh of Banff the large collection of Highland targes of leather, suits of plate-mail and chain armour, and arms of various dates that was formerly at Duff House, before it, with the adjoining grounds, was presented to the Burghs of Banff and Macduff.

Whereas the standard quality in which steel joists are rolled in certain foreign countries is only 23½ to 27 tons tensile strain, as compared with the British standard quality of 28 to 32 tons, it is of great importance that British architects should be wary of steel joists that come on to a building without a brand, or with only a letter or two. Our principal British steel-rolling firms brand their standard joists as under:—Messrs. Dorman, Long & Co., Ltd., "Dorman, Long & Co., Ltd., Middlesbrough"; The Cargo Fleet Steel and Iron Works, Middlesbrough, "Cargo Fleet, England"; The Earl of Dudley's Round Oak Works, Ltd., Brierley Hill, "Earl of Dudley—Steel"; Frodingham Iron & Steel Co., Ltd., Frodingham, "Frodingham Iron & Steel Co., Ltd., England"; Glengarnock Iron & Steel Co., Ltd., Glengarnock, N.B., "Glengarnock Steel"; Lanarkshire Steel Co., Ltd., Motherwell, N.B., "Lanarkshire Steel Co., Ltd., Scotland—Siemens Martin Acid Process"; Walter Scott, Ltd. (Leeds Steel Works), Leeds, "Leeds Steel Works"; Shelton Iron, Steel & Coal Co., Ltd., Stoke-on-Trent, "Shelton Steel."

## COMPETITION DESIGNS FOR BATHS, WOOD GREEN, MIDDLESEX.

In this limited competition several well-known experts in the planning of baths were invited, but they seem to have been rather thrown out of their stride by the unusual nature of the conditions and failed to appreciate the key of the situation.

There can be no doubt that as a general rule baths do not pay unless bathing can be supplemented by entertainments, and the problem at Wood Green was to facilitate this as much as possible, with which idea it was stipulated that the dressing-boxes were to be in a separate room outside the swimming bath. Of course, this does not make for economy in the original cost of the building, and cost was supposed to be a vital element in the competition. We had not time to cube out all the designs, and the authors' reports were not attached to the drawings, but it was clear that if some of the designs could be carried out for the sum limited—8,000*l.*—others could not. We do not think the winning design by Mr. Harold Burgess would much, if at all, exceed the limit.

Mr. Burgess's design is far and away superior to all the others in providing a hall for entertainments which could be used on occasion for a swimming bath. This may look like putting the cart before the horse, but if baths are to be maintained at the expense of the ratepayers we are sure that the revenue from lettings is a very important item and one that must be carefully considered.

The site for the baths is at the corner of Western Road—which is to the east of the baths—and a new road on the north, and the conditions provided that the principal front should face the new road. Competitors for the most part seemed to think that the main entrances should be on the principal front, but the author of the second premiated design, Mr. E. Harding Payne, so far departed from this reading as to place all his entrances on the side, which, by the way, was the longer dimension, and to make his principal front mostly blank wall with meaningless columns and pilasters merely for decoration.

Another condition of the instructions which seems to have been a stumbling-block to competitors was that the swimming bath which is to be first built was to be at present chiefly for men, but occasionally for women, for whom hereafter a second bath is to be built. A few slipper and ablutionary baths for each sex had to be provided, more for the look of the thing, we imagine, than as a paying part of the establishment, as Wood Green is one of those quite modern neighbourhoods where nearly every house has a bath of its own, even if it is only in the scullery.

Mr. Burgess has placed his entrances for men and women in the new road, with the usual one-ticket office, and has located his private baths at this end of the site. His men's entrance leads to a good hall, 22 feet square, which forms a crush-room to the hall swimming bath. This is 55 feet by 121 feet with a pond 30 feet by 100 feet, and has a gala entrance in the middle of the side from the Western Road, and another exit adjoining the club-room and w.c.'s, &c., at the far end. The dressing-boxes are on the right or west side of the men's swimming bath and between it and the future women's bath. Thus they are available for either sex, whilst, as we have already said, the arrangement for entertainments is admirable. Mr. Burgess's elevation is simple and effective, with an open loggia divided by Ionic columns, and his detail is about the best in the competition. The one fault in the plan is the small size of the areas into which look w.c.'s, &c., but there is a good feature of compactness.

The author of the second premiated design, Mr. E. Harding Payne, puts all his entrances, as we have said, on the east side, on which are his dressing-boxes and his private baths, but he cannot get away altogether from tradition, and has provided some collapsible dressing-boxes at the side of his swimming bath. He has provided an emergency exit or club entrance next the club room at one end of his bath, and in the size of his internal areas does better than Mr. Burgess.

Messrs. F. J. & F. D. Smith, the authors of the third premiated design, place their main entrances on the principal front and give an emergency exit from the back. One point about their plan that we do not like is that when the women use the swimming bath they have to go through it to the dressing-boxes, thus neutralising one advantage that is to the credit of the method of placing these in an annexe instead of round the sides of the bath itself.

Mr. R. S. Ayling has a curious arrangement of entrances, that for the men from the Western Road, and that for the women from the new road, the ticket office being at the corner.

Mr. Stuart Hill's plan is too expensive, with much corridor and wasteful space in the dressing-room. He has the merit of two emergency exits from the swimming bath.

Mr. H. T. Bonner has a plan that economises attendance, one attendant being so placed as to command the swimming bath and its entrance as well as the men's private baths, whereas most of the competitors, including Mr. Burgess, require two attendants for this duty. Mr. Bonner has an almost too good plan for the private baths, but, as in the third premiated design, the women have to pass through the swimming bath to reach the dressing-boxes.

Mr. Arnold S. Taylor sends a plan which is compact and avoids corridors, but the club room is entered from the bath, and there are no emergency exits. Hence he fails from the entertainment point of view.

Mr. Maurice B. Adams's plan is good, with main entrances from the Western Road and exits from the bath to the new road. His elevation would not rank with his best work.

Mr. A. Saxon Snell has his entrances on the new road, but by putting his dressing-boxes between them and the swimming bath becomes involved in an unnecessary and wasteful extent of corridor. His bath is lacking in emergency exits for entertainments.

Messrs. T. Dinwiddy & Sons also indulge in too much corridor, and though they place their swimming bath next to the Western Road, have not taken full advantage of this disposition to make it excellent for entertainments, but give only one emergency exit.

Messrs. WEIR, BURROWS & WEIR have a good plan, of which the chief fault is expense, though they oblige the women to go through the swimming bath to reach the dressing-boxes.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute was held on Monday evening last at Conduit Street, W., Mr. Ernest George, President, in the chair.

Mr. JOHN BELCHER, R.A., rose to ask that before the business of the meeting was proceeded with he might be permitted to act on behalf of the Institute in venturing to offer congratulations to their President on his election to the Royal Academy. The election had been a source of great pleasure to all the members, and in addition it had given satisfaction to the public who had long recognised in Mr. Ernest George an artist of distinction who had become known to the world at large. There was reason for congratulation that it had happened during Mr. George's term of office, even though they would have been still more pleased if it had come sooner. However such were the vagaries of election to the Academy it sometimes happened that the best man was left out. Fortunately they could now congratulate him and wish him a long life in which to further the interests of his art.

Mr. ERNEST GEORGE, A.R.A., in saying a few words of thanks expressed the hope that his brother architects would think that his election to the Academy was a suitable one. The compliment was primarily conferred on him, no doubt, as occupying the presidential chair.

### Carr of York.

Mr. S. D. KITSON, M.A., F.R.I.B.A., then gave an extremely entertaining lecture, which was illustrated by a large number of slides, on the above subject.

Carr of York flourished between 1750 and 1800. His work has escaped the attention lately given to the architecture of the eighteenth century. The reason for this is that Carr's work is dull and uninspired. It forms a part of the last chapter in the history of the English building tradition.

Carr was a busy and highly successful man. In the last half of the eighteenth century, a very large number of the country houses in Yorkshire were rebuilt, and many new ones arose. Almost the whole of the building was designed by Carr of York. He had a similar origin to that of the master-masons of six centuries before. He was the son, grandson, and great grandson of masons, and he had all the practical knowledge and hereditary tradition which then made for progress. But Carr tried no experiments, he made no advance, and the old building tradition after his fifty years of abundant employment had almost disappeared.

John Carr was born at Horbury, near Wakefield, in 1723. After passing through the village school he was early set to work either in the quarry at Horbury which his father owned, or upon buildings such as Chevet Park and Bretton Hall in the neighbourhood, on which his father was master-mason. Carr, conscious of the lack of scope for his ability, removed to York before 1750. He quickly gained employment, and soon he had the field to himself. Indeed no other architect would seem to have done work in Yorkshire when once Carr had established himself in the confidence of his fellow-Yorkshiremen.

When Carr settled in York it was both by population and tradition the metropolis of the north. Lord Burlington had been the Lord Lieutenant, and his headquarters were still at York.

Social interest centred round the race-course on the Knavesmire, and the erection of the grand-stand there marked the beginning of Carr's architectural success.

Carr is first heard of in York as the builder of Kirby Hall at Great Ouseburn in 1750, the designs of which were supplied by Lord Burlington and Morris. In 1752 the York Corporation voted him 83*l*. for enclosing the Pikeing Well with an ornamental building; 25*l*. were to be returned as redemption money for the freedom of the city. But "John Carr, stone-cutter," did not become a freeman until 1757.

In 1754 the grand-stand on the Knavesmire was designed and built by Carr. It was paid for by the issue of five-guinea admission tickets. The grand-stand was a broad and simple piece of Palladian design, and it gave the greatest satisfaction. Lord Rockingham, the chief promoter, was delighted with it, and remained a good friend to Carr throughout his life. The other country gentlemen followed his example and exclusively employed Carr as architect.

Henceforward Carr ceased to practise as a master-mason and became solely a designer of buildings. His training for this new rôle was mainly the inheritance of a sound building tradition and his practical upbringing, added to the example of straightforward work by James Paine in the West Riding and the guidance of Lord Burlington and one of his professional architects. Besides these there were numerous pattern books and Carr's own shrewdness. His training equally explains the severe limitations which are so noticeable in his designs, the excellence of his masonry and the practical character of his planning. The demands then made upon the knowledge of the architect were small, clients being content with very ordinary designs so long as the houses were well built and had spacious rooms.

The first houses which Carr designed were large red brick buildings in Castlegate, York, one of which contains elaborate plaster ceilings showing French influence. He also built for himself a house in Skeldergate which is characteristically plain. A little after 1750 York began to decline as a centre of fashion, and Carr's activities were in the direction of country houses. Two early examples are Arncliffe Hall and Whitewindows, near Halifax.

The first building which marked the turning point in Carr's career was the grand-stand at York; the second was Harewood House. It brought him into contact with the Brothers Adam, and henceforward his work loses in robustness what it gains in "elegance." A complete set of plans and elevations for Harewood House by Adam exist in the Soane Museum. These are so similar to Carr's design that Carr must have been influenced by the competition work, modifying it and supplying the detail drawings. The chief interest of the house is the flat relief plasterwork by the Brothers Adam. Thomas Chippendale designed the furniture, and "Capability Brown" designed the lay-out of the grounds. Carr learnt a great deal from each. But much more characteristic of Carr is the village of Harewood. The semicircular arch is almost the only form of decoration, and by its means the cottages are marshalled into regular blocks, with the larger houses of the doctor and the agent set between. The effect is fine and dignified.

After the building of Harewood House Carr's position was undisputed in the North of England. Denton Park is a typical example of his larger houses, with wings attached. The masonry is faultless, the design is cold, regular and uncompromising. There is the usual entrance on the south front direct into a large square hall—Carr never built a porch to his entrances. There is his favourite device of a bay window extending the whole width of the room and balanced on the other side by chamfered angles, in which, when the room was used for a dining-room, the sideboards were placed. The planning of the earlier part of the century had been much improved upon; it was no longer necessary to go through one room to get to another, the living rooms being now always entered from hall or corridor. The interior decoration can hardly be distinguished from the Adam's work. The rooms were comfortable, with every detail exactly right. The floors were of double thickness, and the cross walls were usually very thick, with double doors, so that his houses are practically sound-proof.

Constable Burton, in the North Riding, is a smaller house without supporting wings. The principal floor is on the first storey, and the columned portico with the flight of steps forms a fine approach to the entrance hall. The plan is compact and good. Carr was driven by his square plan to top-lighting for dressing-rooms and closets.

When the principal floor is so far from the ground the inconvenience of the outside steps on a rainy night is obvious. Carr seems to have been conscious of this, for at Basildon Park, in Berkshire, the only example of Carr's work in the south, the steps are inside the loggia under the portico.

At Gledhow Hall the principal rooms are upon the ground floor, as was Carr's practice in nearly all his later houses.

In 1767 the project of building an infirmary for Leeds was set on foot. Carr was approached, and wrote from Aston Hall:—"I can perhaps be of use to you in composing the necessary convenienceys which are requisite in such a building with some degree of art, but have not the opportunity of conducting the execution for you."

Among the latest examples of Carr's domestic work is Hackness Hall. It is one of the largest houses of his single-block type, but beyond a greater tendency to refinement of detail, due to the Greek revival fashion, and an unhappy attempt to broaden his windows, it is similar to his work of thirty years earlier. The house is a fine example of mason's work, like all Carr's buildings. He always selected the very best stone and used it with knowledge and judgment. Almost everywhere he found excellent building stone to hand.

For buildings near towns he often preferred brick. In Wakefield, for example, he is responsible for some of those great plain, comfortable-looking brick houses in Westgate. Thornes House is another of these brick houses.

Carr also made additions to many existing houses, but he never introduced any other style than his own. He planted down his additions exactly as and where requirements dictated. The gallery at Wentworth Castle and the entrance hall form part of an addition by him; and of this Horace Walpole wrote:—"Mr. Gilpin sillily could see nothing but faults there. The new front, in my opinion, is one of the lightest and most beautiful buildings on earth."

Carr was for long an alderman and on two occasions Lord Mayor of York. His portrait by Sir William Beechey shows him as a genial and shrewd old man. By his side are his plans of the Crescent at Buxton, designed for the Duke of Devonshire. More interesting is the great riding school behind the Crescent, now a hospital.

In York the County Lunatic Asylum with its simple lines and pleasant colouring forms a dignified termination to a long strip of park. The semi-circular relieving arches of brickwork over the first-floor windows form one of Carr's favourite motifs. The Court House and Debtors' Prison at York, facing each other on Castle Green, and which are precisely similar in design, form the only opportunity which Carr was given in York for formal grouping. The plan of the Court House was modelled upon the Roman basilicas. The town halls of Lincoln, Newark and Chesterfield show Carr's usual careful treatment, and form an appropriate setting for the deliberate municipal life of the period.

In 1790 Carr obtained permission to pull down the village church at Horbury, where he had worshipped as a boy, and to build a new church of Classic character at his own expense. Its poverty of design and want of appropriateness reflects the spirit then existing in the Church of England. The church was regarded as a triumph of artistic skill.

Carr made occasional excursions into Gothic, and the aisles of Dewsbury Church and the east part of Sheffield Church show that he neither understood nor appreciated it.

There is a lithographed portrait of Carr, drawn in 1796 by George Dance. It shows his face in profile. In 1791 he was elected one of the nineteen original members of the London Architectural Club, who met monthly at the Thatched House Tavern for the purpose of dining together. So exclusive was the Club that future candidates were to be Academicians or gold medallists in architecture, and one blackball was to exclude.

During his last years—he died in 1807 at the age of eighty-four—Carr retired to a country life at Askham Hall. He seems to have enjoyed nothing so much as his long driving tours, when he would show his nieces the work he had done.

Carr belonged to the old, leisurely order of things. He accepted the traditional style and method which he found, and was content to maintain the high technical level of workmanship for which the eighteenth century is famous. And so, if Carr's buildings are sometimes dull, they are always sensible and fulfil Inigo Jones's requirement that architecture should be "solid, masculine and unaffected." He himself merely claimed to be able "to arrange the necessary convenienceys with some degree of art."

Mr. J. A. GOTCH, F.S.A., F.R.I.B.A., in opening the discussion on Mr. Kitson's paper said that all those who were interested in the history of architecture must be grateful to anybody who went to the trouble of writing a monograph on one of its practitioners. In one point he thought that Mr. Kitson had done an injustice to the architects of Yorkshire, in that he had only pointed to two periods of great building activity, thereby omitting all that had been done in the seventeenth and sixteenth centuries, so much of which was entirely suitable to the environment. That was the only mild exception he could take to Mr. Kitson. The history of Carr of York was very interesting; he seems to have been one of the last of the mason-architects who did so much towards filling the country with all the beautiful buildings which now exist. The mason of those times was certainly responsible for the detail if not for the actual planning of the buildings which were erected. Carr was a man who combined the two. He seems to have been only thirty-one when he designed the grand-stand at York and became a full-blown architect. This sudden development prompted the reflection as to how much training was then necessary. At the present day the young architect has to have his "years of learning" and his "years of wandering." But in Carr's time they got off much more cheaply in time and money. Of course the conditions had entirely changed, as was emphasised by those recent decisions in the law courts which point to the architect's ever-increasing responsibility, and suggest the necessity of experts forming themselves into a company for the practice of architecture, one a builder, another a designer, one a lawyer, and perhaps, "judging from a late experience," one a naturalist. These and other troubles, including dry rot, Carr of York seems to have been entirely free from. The training he got was entirely sufficient for his period. In those times there was no complexity of planning; so long as the architect got his ground plan fairly evenly divided and the façade nicely balanced, his troubles were over, the plan, of course, being made to fit the façade. All this was very easy, for there were no special requirements. No house had then an ignoble side. In the previous houses, however, it was considered no disadvantage to approach the main structure through buildings more or less given up to ignoble uses. In the eighteenth century the façades were equal or nearly equal, and both the plan and the elements of design were simple. The pattern books were of the utmost use to architects. Perhaps to-day we err rather on the other side and there is a little too much originality. Two centuries ago when you turned round the corner of a house you knew exactly what you were going to find, while nowadays you usually find something unexpected, and often something undesirable. The pattern books led to the general adoption of one style instead of as now following a number of different ones. However, there was reason for thinking that this latter fault was becoming modified, for there were not now the fantastic designs rampant fifteen or twenty years ago. Carr's ambition was one shared by most architects, viz., to design the necessary conveniences of building with some degree of art.

Mr. H. A. TIPPING, M.A., F.S.A., expressed a wish that there were more students who would let us know about the architects of the past. In considering Carr it was important to bear in mind his lowly origin. It was customary to say that after Inigo Jones's time all was changed in the personal side of architecture. But it had just been shown that as late as Carr's time there were architects who had derived their education not from the drawing-board but solely from the workshop. Lord Burlington and the architects who worked with him travelled to Italy to drink at the very sources of classical art; but on the other hand there were many embryo architects in the masons' yards. Thus Sir Robert Taylor was the son of a stonemason and started life as a maker of lead statues. Several Yorkshire architects were connected with the building trade. Kent began as a coach-painter, and others were carpenters. Indeed a great number of eighteenth century architects were carrying on the tradition of the mediæval craftsmen-designers, so that it appeared as if there was a great deal to be said for the training derived from the workshop. Carr was only concerned with carrying on the traditions which he found. He always looked back longingly to the pattern-books, and he was essentially conservative. There were other little known architects besides Carr who would repay detailed investigation, as for instance Smith of Warwick. These offered splendid scope for local architects willing to follow up this field of inquiry.

Mr. H. H. STATHAM said that although the architectural work of Carr may have been dull, Mr. Kitson had been able to read a paper which was the very reverse. It might not be generally known that Elmes in designing St. George's Hall, Liverpool, tried to get a vista from one end to the other in the same way as Carr had done at York. When it was proposed to erect an organ Elmes was extremely indignant as it threatened to spoil the effect. As to the external staircase and piano nobile which formed such a fine feature of Carr's best work, every one nowadays seemed afraid to go up an external staircase in the rain. But the speaker said he would like to see someone revert to them, for a finely planned one offered compensation for getting wet. As to the portrait of Carr by Dance, it was among the pictures shown recently at the Royal Academy. The notion of Capability Brown as to the best way of laying out an estate seemed to be to cut down the trees and then introduce a sunk fence. Mr. Statham, in concluding, again referred to the most interesting and charming paper which had been read.

Mr. E. GUY DAWBER said that he was very interested in the subject of the architects of the different towns of England for it had always seemed to him that a great many bore the impress of one man. At Stamford, for example, all the interesting and delightful work was due to one man. A little known personage was Henry Bell of Lynn, who was twice mayor of that town where he had settled. Towards the end of the seventeenth century he built there one of the most beautiful buildings we had in this country, viz., the Custom House; he also built a series of remarkably beautiful houses which are as fine as anything Wren ever did. Similar cases of a single architect making his individual mark on a town were to be found all through the country.

Mr. S. D. Kitson, in replying to the vote of thanks, related a story of Carr's connection with Constable Burton, in the North Riding. It was said that Carr was called to the house for the purpose of remedying some defects in the kitchen range. When the owner returned it was to find that his home had been rebuilt from Carr's designs. Until quite lately there was no interest at all manifested in this eighteenth century house. The plan had been used for waste paper. In dealing with Carr it had to be admitted that he simply looked upon his work as a means of making money and of raising himself out of his class. When he died he left 160,000*l*. What really interested him was not his art, but to become a country gentleman. That explained his lack of originality.

The award of prizes and studentships was made immediately after the reading of Mr. Kitson's paper.

Six essays were submitted for the Institute silver medal and twenty-five guineas. The subject set was "The Treatment of Gardens in connection with Buildings." The first place was awarded to Mr. J. A. O. Allan of Aberdeen ("Domus et Hortus"), and a certificate of hon. mention to Mr. J. Nixon Horsfield, A.R.I.B.A. ("Rez de Chaussée").

There were twelve competitors for the Institute silver medal and ten guineas for drawings, the subject being "Measured Drawings of Ancient Buildings in the United Kingdom or Abroad." Mr. James Whitelaw, London ("Roma"), secured the prize with six strainers (No. 11) of the Wellington Monument. The second place and a certificate of hon. mention with five guineas was awarded to Mr. Cyril Farey, London ("François Mansart"), with six strainers (No. 5) of the Hôtel Carnavalet, Paris; a certificate of hon. mention to Mr. J. Rowse, Liverpool ("Adige"), with five strainers (No. 2) of the Palazzo Pompeii and Palazzo della Gran Guardia Vecchia, Verona.

The subject for the Soane medallion and 100*l*. (for continental travel) was "Design for a Shakespeare Memorial Theatre." There were seventeen designs, and of these the five strainers (No. 17) by Mr. Alick G. Horsnell, Chelsea ("Mirth"), were awarded the first place. The second place went to Mr. Adrian Berrington, Chelsea ("Horse Shoe"), with four strainers (No. 5), who receives a certificate of hon. mention and ten guineas.

For the Owen Jones Studentship, certificate and 100*l*. (for travel and study of colour), there were three competitors. The studentship goes to Mr. W. O. Miller, who sent six strainers; Mr. H. R. Wilkinson was placed second, and will receive a certificate of hon. mention and ten guineas.

For the Pugin Studentship, silver medal and 40*l*. (for travel in the United Kingdom), there were six competitors. Mr. H. Hubert Fraser was placed first; Mr. D. J. Chisholm and Mr. J. B. F. Cowper will each receive a certificate of hon. mention and ten guineas.

The Tite Prize, certificate and 30*l*. (for travel in Italy), was not awarded this year, but the Council awarded a certificate of hon. mention and ten guineas to No. 4 ("Jupiter"), Mr. William A. Robb, Glasgow. Certificates will be received by Mr. A. R. Barker, No. 12 ("Comprised Within") and Mr. W. Friskin, No. 10 ("Tomahawk"). The subject was "Design (according to the Principles of Palladio, Vignola, Wren or Chambers) for a Sunk Garden, surrounded by Loggie."

The Arthur Cates (forty guineas) was awarded to Mr. C. D. Carus-Wilson out of five competitors.

The Grissell gold medal and ten guineas (for design and construction) was awarded to Mr. C. P. Walgate, London ("Fra Angelico"). The subject was "Design for Two Western Bays forming a portion of a Vaulted Church."

The Godwin Bursary, silver medal and 65*l*., was awarded to Mr. W. Milburn, jun.

The Ashpitel prize was awarded to Mr. W. J. Roberts, of Manchester.

## BEAUTY IN ARCHITECTURE.

By B. R. Gribbon.

*(Concluded from last week.)*

VITALITY is the power which some buildings possess of suggesting life. Compare such buildings as the Choragic Monument of Lysicrates and Trajan's column at Rome. Do not the delicate leaves and scrolls of the capitals in the Athenian monument, the exquisitely proportioned entablature and the curves of its surmounting scrolls as they sweep upward to the graceful finial, suggest life and aspiration? Is there not something in the whole design which suggests its relationship to the most emotional of arts—music? It seems to be almost the embodiment of music in stone. Then turn to Trajan's column. It is strong, vigorous, striking. It has no want of vitality, and yet no two conceptions could differ more. Trajan's column is outcome of a bold and strident claim to honour for material prowess. It flaunts the record of its creator before the world and demands rather than appeals for admiration. It makes no attempt to stir the imagination, it simply holds up a vast scroll of pictorial record and on that bases its claim to honour and existence. Both these monuments are instinct with vitality; but the one is of the spirit, the other of the world.

Restraint comes next, and was more usual in Grecian work than it has been in any other. In the buildings of ancient Greece it seems to have been recognised as it has been in no others, that superfluity is an impertinence. So in all that work we find no feature which is not structurally or artistically necessary. Take the Temple of Apollo at Bassæ for example. We know that the typical Greek temple design was essentially simple, yet here we find three orders in one building, a door on the eastern side at the south end of the cella, as well as the usual one at the end, and internal wing walls against which the half-round Ionic columns abut. Why? There was a reason for each and all of these innovations we may be sure, and so perfectly is the purpose of the design expressed, its beauty in the truest sense, that we can at least suggest what were the probable reasons. The Doric was the order most naturally adopted at Bassæ: it was the national type of Arcadia. But internally higher columns were required, so to avoid distorting the Doric columns, Ictinus, the architect, adopted the expedient which we have already noticed he introduced in the Parthenon, and used the Ionic order. These columns being so much slighter may have appeared to him to be artistically insufficient to support the heavy roof, or perhaps he doubted the ability of the walls to bear its weight. Be this as it may, he introduced short walls which buttress both the columns and the outer walls, and placed his columns, now reduced to semi-columns, at the ends of these. A door must have been required for access to the statue at the south end, and perhaps also to light it, while the column adjacent to it seemed to require distinction from those of the cella, and this was obtained by making it of the Corinthian order, no doubt a reminiscence of the garlanded votive column which it virtually replaced. And a glance at the drawing showing a restoration of the temple by Professor Cockerell shows what a wonderfully impressive interior the whole design produced. It may be objected that this design is Cockerell's, not Ictinus's, but the very fact that from the fragmentary remains at his disposal Cockerell has been able to produce a wonderfully impressive drawing at least correct in all its essential details shows that the original design must have possessed the essentials of that living principle which we have defined beauty to be, and must have possessed them in no ordinary degree, since it has enabled a skilful antiquarian to produce after an interval of 2,300 years an interior little if at all inferior to that of the Parthenon itself. It is the perfect restraint, the rigid exclusion of everything not essential, that has given to the Parthenon and to the Temple of Apollo their extreme beauty.

And now look at the Temple of Castor at Rome. First take the features one by one. Each is well designed and cleverly carved, good in itself and fairly refined in detail. Then look at the building as a whole. Restless and overburdened with ornament, it is tiring to look at it; impossible to grasp the import of each carved line. There is no restraint, no relief in plain surface, to set off the too abundant ornament, and what might and should have been an added glory to the building has ruined its effect, and made it merely a museum of Roman skill in ornament.

And, lastly, we come to the fourth essential—"freedom from affectation." This seems to be almost a modification of restraint, for affectation is the adoption of the unreal and unnecessary. No feature in the building should pretend to be what it is not: structural parts must reveal their purpose and not be weakened artistically with futile ornament. The scale, the actual size of each part of the building, must be appropriate to its purpose; no feature of any style must be used for any other than its traditional and legitimate use. The universal standard for judging scale is the human figure, and if when seen in comparison with it any portion of the building seems unduly large or insignificantly small, the scale is wrong, and the beauty of the building will suffer through an affectation of sham importance or will seem petty and insignificant. Compare the Temple of Jupiter at Agrigentum with the Colosseum, Rome. Monumental and impressive the temple is, but if we could see a human figure by the side of one of those mammoth steps of the stylobate the sensation of the unfitness of such a scale for practical purposes must greatly lessen our appreciation of such an otherwise successful design.

The Colosseum is nearly twice the size of the Temple of Jupiter (the length is 620 feet against 323), but the sensation of inappropriate size is wanting here: the scale is human. The vast building is divided into so many bays, all of which are in perfect unison, that while the size of the building is fully appreciated, it does not seem too great for human use; while the temple at Agrigentum seems fitter for the habitation of the god in whose honour it was erected than for the purposes of his human votaries.

So Inigo Jones's definition seems to cover all that is included by the term of "Beauty in Architecture." Of course, each of his factors is reliant on many minor considerations. The site, the aspect of the building, the position of the various materials, their characteristics, texture and colour, all play their part; but each of these is comprehended in the definition he has given, and no building which is "solid, proportional according to rules, masculine, and unaffected" in all respects can ever be said to be deficient in "Architectural Beauty."

## LLANDAFF CATHEDRAL.*

By S. Bowen Williams, M.S.A.

*(Continued from last week.)*

We will now in imagination enter at the west door and pass through the cathedral, taking note of the more important features as we proceed.

On opening the west door you remark the absence of a porch, and you have a vista of the whole length of the cathedral revealed before you.

You are led down the long, unbroken range of the main arcade, with its graceful line, until the eye rests on the remarkable Norman arch at the east end of the presbytery. The small size of the cathedral prevents the effect of this unbroken arcade from being overdone, as is so frequently the case in larger cathedrals. The nave arcade is Early English and original; it is very well proportioned and the scanty foliage is excellent and typically Early English. The arcade in the choir is very similar, but later in date and Decorated in character. The piers, you will note, are by no means commonplace and well worth examination.

The absence of a triforium will at once strike the eye; the clerestory is new work, but is a faithful reproduction of the original work, there having been left intact one complete bay to serve as a guide to Mr. Pritchard. A wall passage is carried round the church at the clerestory level, this being rather unusual.

The aisles are original Decorated work, with the exception of the external buttresses, which were inserted during the restoration to strengthen the nave arcade. The windows are all of one type and are original. You will notice the ogee turn at the top of the window arches. The two small doorways towards the east end of the nave aisles are Decorated work, but the two larger portals towards the west end on the north and south sides are portions of Urban's church. We will refer to them later.

The west end of the nave is a very ingenious arrangement and produces a very good effect. The few steps down into the nave from outside give greater height to the inside as compared with the outside, and hence the sills of the main range of windows can be brought lower and so increase the apparent window space. The two outside jamb mouldings are brought right down to the floor, and so the first two compartments of this end are united. The rich moulding of the window jambs and the splay of the sill give a very rich and pleasing effect, especially considering the small material there is to play with. The arrangement of this west end is well worth study.

At the east end is the great Norman arch over the altar. It is a portion of Urban's church, but it is a moot point whether it marks the division of nave from choir or whether, as at present, it was at the east end of the choir. It is a very fine specimen of its kind, and has been likened to one at Hereford Cathedral, built about the same time; but this is the better of the two and compels attention as soon as you enter the church.

It recedes in four orders, and has the usual mouldings peculiar to Norman work. The abacus of the capitals is moulded and is continued along the wall on either side of the arch. Its most striking feature, however, is the studded moulding round the outside of the arch. This consists of a number of circlets, with a centre of eight leaves and an outer ring of small rounded projections. It is unique, or at all events of very rare occurrence. The arch is slightly stilted and has a tendency to be "horseshoe" in shape.

Over this arch is a gallery and arcade, with a traceried window in the centre and a blind arch on either side.

In the presbytery is to be seen some curious work. This portion of Urban's church was rebuilt in the Decorated period as already stated, and in doing so the Norman work has been allowed to remain as far as possible. There are still to be seen the heads and jambs of two Norman windows, cutting into the Decorated work in a peculiar and somewhat awkward manner. The reason is hard to find, but it has been suggested that the remains of St. Dubricius were placed here and that the builders did not wish to do anything which would disturb the tomb.

It has been thought possible that there was at one time a pair of flanking towers to the choir, but this is not easy to decide. No remains of any value are to be found indicative of this.

It was in this portion of the church that Mr. Wood erected his Italian temple, and after it was removed and the plaster scraped away the original reredos was discovered. It was a fine piece of Decorated work, but was too much mutilated to be of any use. It was removed and a new one put in its place, consisting of three gabled arches and battlemented cornice. The three panels under the arches contain paintings by Dante Gabriel Rossetti. The old reredos is now to be seen in the north aisle of the choir.

The stalls, organ, and episcopal throne are all new, and have all been done in Llandaff by Mr. Clark, under direction of Mr. Pritchard. They are very elaborately carved in teak, with inlays of various woods, and are well worth a close scrutiny.

*(To be continued.)*

## ILLUSTRATIONS.

### CATHEDRAL SERIES, LLANDAFF.—WESTERN TOWERS AND SPIRE.

The description of Llandaff Cathedral is continued and this view forms one of the series of illustrations.

### SKETCHES IN SOMERSET.

These sketches are part of a series by Mr. John Th. Westbye, which we shall continue in following issues, and of which the article on Wells and Glastonbury, published last week, is explanatory.

### COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

The accompanying drawings illustrate the design submitted by Mr. Arthur J. Gale, F.R.I.B.A., F.S.I., in the recent competition for the above. The plans explain themselves. It might be mentioned that an endeavour was made to group the whole of the buildings and departments so as to be easily accessible from one to another, hence the altered position of the Council Chamber. The acoustics of the Great Hall were carefully studied, which was planned on lines which were found the most successful both here and on the Continent. The Magistrates' Court was brought down from the first floor and placed on the left of County Court, and its place above utilised for the new Banqueting Room.

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* See Illustration.

## THE ARCHITECTURAL ASSOCIATION.

MEETING of the Association was held on Friday evening
last at the premises in Tufton Street, Westminster, Mr.
Tanner, F.R.I.B.A., President, in the chair.

On the motion of the President it was agreed that a
essage of congratulation be sent to Mr. Ernest George on
e honour he had received in being elected an Associate of
e Royal Academy.

A vote of thanks was passed to Mr. Howard Chatfeild
larke for a donation to the library of bound copies of *The
rchitect* and R.I.B.A. Transactions.

Mr. J. Starkie Gardner read a paper illustrated by
ntern views entitled—

### A Comparison between English and Continental Ironwork.

Throughout the Renaissance period in France the iron-
ork, like the architecture, was traditional, but pro-
undly influenced by that of Italy, for François I. and
enry II. and his consort encouraged Italian artists to work
nd settle, just as his contemporary Henry VIII. encouraged
em to settle here. His fickle continental alliances, how-
er, led him also to favour Germans and Flemings. Such
fluences were not lasting as regards ironworking, and
cept richly decorative locksmithing, which had always
en a cherished art in France and one neglected here, the
onwork in both countries was alike meagre and utilitarian.

The first indication of a revival is seen in France, and
actically coincides with the accession of Louis XIII. in
10. The Italian influence had long since waned there,
d Henry IV. had himself suffered through it. It was
ue that ironworking was in full swing in the bordering
untries of Germany and Spain, where the smiths were
dulging in *tours de force*. But the revival in France is
solutely free from any trace of the influence of either of
ese countries. It was a new style, gradually evolving,
egant and restrained, in the native taste, but with an
er-growing tendency towards the rich and sumptuous
rves and scrolls of the Baroque. Rubens had a command-
g influence in France from 1622, when he was decorating
e Luxembourg for Marie de Medici, almost to the time of
s death. The arts, painting, sculpture and architecture
lt his influence deeply; how should ironworking escape it?
ubens may personally never have prompted a design in
onwork during his life, but he powerfully influenced, if
did not inaugurate, the sumptuous freedom and splendour
colour which characterised French art for upwards of a
ntury. The ironwork followed the same lines as far as the
aterial permitted, and as might be expected from a mate-
al so facile when hot, and in the hand at the outset of
fted craftsmen, wholly unrestrained by traditions and
les, it developed even more rapidly, but more consistently,
an in Spain or Germany. Ironworking became a firmly
tablished art in France, and it remained so, apart from
odifications due to changes of fashion and sentiment, until
e monarchy itself ceased to exist. To trace its develop-
ent, however, is a difficult task, and one I am not qualified
follow up to-night. The French smiths began to engrave
d publish their designs in 1615, following the example
t by Androuet du Cerceau. Louis XIII., who died in
43, had been a great patron, and it is certain that much
e ironwork had come into existence in France during the
st half of the seventeenth century, which could hardly
il to attract the attention of travelling Englishmen. The
ils around the statue of Henry IV. on the Pont Neuf,
dered by Richelieu in 1640, were lofty and of plain bars
th a rich cresting, and Evelyn notes them as a "strong
d beautiful grate of iron." He also observes, under date
49, of the gardens of the Château de Maisons, "the iron
tes are very magnificent." These were perhaps those by
an Marot, who was but thirty years old, but his illustration
them was not published till much later. They would well
serve the encomium of "very magnificent," for they are
deed the well-known gates that now, brilliant and polished,
se the Galérie d'Apollon of the Louvre.

It is strange that the taste for rich ironwork did not at
ce penetrate from France to England under the artistic and
ltured Charles I., who was such a princely patron of Van-
ke and Rubens. Under Cromwell the English Channel was
obably a mare clausum to French art; but it is almost
olly inexplicable that the reign of Charles II., with its
flux of highly-skilled Huguenot craftsmen, should have
iled to welcome it, just when it was at its zenith in France.
the young King Louis XIV. expanded into the grand
narque towards 1660 the field for the smith's art rapidly
dened. In France royal and noble palaces were approached
rough spacious courtyards surrounded by iron railings with magnificent gates; while the gardens, parks, and avenues by which they were environed demanded elaborate iron fences, gates, and wickets. Staircases were enlarged into grand architectural features of palatial dimensions, and occupying central positions, these required iron balustrades of the most sumptuous possible character. The smiths thus stimulated, naturally vied with each other in the magnificent pride of their work and the increasing difficulties demanded from its execution. The greatest architects entered the arena of rivalry and supplied the designs. Mansard designed the screens for Clagny and for Meudon; Girard that for St. Cloud, and Gittard that for St. Maur. Men of such boundless influence as Jean Lepautre, Jean and Daniel Marot, Jean Bérain, Jean le Blond, and Langlois, published "Livres de Serrurerie," or included numerous designs for smiths in their works on ornament. Lesser men followed suit, while the smiths themselves by no means desisted from publishing pattern-books of their own work throughout the reign. These publishers among the craftsmen were, as in all times, by no means the best workmen.

The commissions given by the King for Versailles alone amounted to over a million livres between 1664 and 1680. This extravagance led to the disgrace, and thus, indirectly, to the death of Colbert; as a mistake in the measurement of a window led to a quarrel with Louvois, who only averted disgrace by plunging the Roi Soleil into a new war. Of these works, the smiths, Godignon and Dezeutres, executed the great screen, and Luchet the gates, to the Court of Honour at Versailles, at a cost of 32,500 livres. Simon Delobel made the doors to the escalier du Roi, and numerous balconies; and Caffieri and Lespagnandel the stair-rail. The royal work was divided impartially, and every capable smith had his share. There was work for all under such a patron.

Though Charles II. patronised Frenchmen like de Grammont, and raised Louise de la Quérouaille to the peerage, and had his grounds laid out in the French taste of Le Nôtre by Verrio, no ironwork in the French manner appears in England during his reign. Such as there is is extremely plain, not more advanced than that produced in France a hundred years before. There are, however, a few notices and other slight indications of the existence of some more decorative ironwork scattered here and there, but not enough to be convincing. It is strange, too, that Wren was in Paris in 1665, "prying into trades and arts," as he wrote home, while the superb gates, railings and balustrades to the Palais Royal, the Bibliothèque, and the Palace at Fontainebleau, and in many of the churches were already in position, work such as had excited the admiration of Evelyn sixteen years before passed without notice by him. Wren was no doubt impressed, but he showed no desire to encourage similar work at home.

On the contrary, there is a curiously plain and geometric pair of gates to the Ashmolean at Oxford, built probably by Wren in 1677. The railings to the Sheldonian Theatre at Oxford, completed in 1668, are interesting as associated with a building erected by Wren so soon after his return from Paris. The bars are lofty and straight, but perfectly plain, with the horizontal bar very low down, the only relief being a scrolled head to the central standard of each bay. These are between the great stone piers with heads of fawns a landmark for visitors. A contemporary engraving shows them to have been put up with the building. A pair of gates of the same construction and destitute of ornament still remain in the corridor behind the rich and later gates of the Clarendon Press. The taste for fine ironwork was thus clearly not due to Wren, who apparently appreciated it as little as his great predecessor, Inigo Jones.

The accession of James made little difference, and it was not until the arrival of the Prince and Princess of Orange, who were inimical to France, that a taste for rich ironwork in the French manner arose in England. The year 1689 is a momentous one in the history of English smithing, for it introduces "Monsieur Jean Tijou," a mysterious person as to whom little beside his work is for certain known. He was no doubt a French Protestant with whom the Princess of Orange must have been acquainted before or from the moment of her arrival in England. It may therefore be safely inferred that he was one of the French Protestant refugees in the Netherlands, and that he came over in the Princess's train. He was unknown, or had at least published nothing in France, for Guilmard, in his exhaustive work on the "Maitres Ornamentistes" only records him as a dessinateur anglais who worked towards 1720. It seems that he became a parishioner of St. Martin's-in-the-Fields, for his daughter was married there to Louis Laguerre, the French decorative artist and pupil of Verrio. A Mrs. Ann Tijou, possibly his mother, who died in 1708, another Tijou, and Laguerre were all buried there, and descendants still live in Soho. His own place of burial and residence and his wife's are unknown, and no will was proved.

However, scarce had the Prince and Princess become King and Queen before Tijou rendered his first bill for six iron vanes "finely wrought in leaves and scrollwork," 80*l.*, and a rich iron balcony, over the river, to the water-gallery, where the Queen was to reside while the palace was building. In this balcony she and her maids were accustomed to sit, work, and receive visitors. His second bill, still extant, was rendered in 1690 for the famous garden screen, 775*l.* 7*s.* This was for the Fountain Garden, a semicircle taken out of the Home Park by Charles II., and which Evelyn saw finishing in 1689. It comprised five fountains and three broad walks, two to the great avenues in the park, the third to the head of the Long Water. Such a screen, of unusual extent and richness, was required perhaps to insure privacy, while clipped yew hedges, beloved of the Dutch, were growing, for the garden faced the principal front of the palace, and was the first laid out for King William and hurriedly completed. Two "lion gates" formed part of the screen. This work for the water-gallery and garden being finished, there was probably a lull till the new palace was ready, but in the interval Tijou was at work elsewhere, the Chatsworth work being completed before 1692, at a cost of 528*l.*; and on that at Burleigh; and perhaps he was also getting on with the magnificent gates for the triple arches of the new front to the palace, opening to the gardens. They still exist, and are examples of his richest work, and standing in shelter they remain to this day in perfect preservation. Each consists of one oblong panel half the height of the gate, a wide and richly-worked lock-rail, and a square panel beneath, the central pair of the three being the richest. The upper panels are scrolled round a central oval, the whole almost hidden by embossed acanthus and flowers. The lock-rail is as rich, and the square panel below repeats a four-way scrolled design radiating from a centre. All are in the rectangular double frames joined at the angles by short diagonal bars characteristic of his work. The side gates are similar, but less rich, and above them is a lintel of scrolls and acanthus. They form the chief item in Tijou's 1694 bill for 1,153*l.* 12*s.* 6*d.*, which comprised some plain staircase rails. Two other pairs of gates are shown in Sutton Nicholl's engraving of 1695, which no longer exist at Hampton Court, though one may now be at Eaton Hall.

From these bills it is clear that from the moment of his arrival he was under the immediate patronage of the Queen, who is known to have taken the greatest interest in the gardens and probably ordered the ironwork personally, and on her own initiative, the King, as is well known, being too much occupied and away. In 1693 Tijou published his great book of designs, and paid Her Majesty the graceful compliment, as it then was, of portraying her as Juno reclining, attended by Vulcan, Mercury, Saturn, Amorini, and a group of the Arts. The man in the frontispiece, with strongly marked features, long hair, and heavy moustache, in redingote and cravat, who is closely inspecting the work of four brawny smiths, is almost certainly Tijou himself, a portrait by his talented son-in-law, Laguerre, who designed it. The other engravers were well-known artists hailing from Antwerp and Amsterdam. This most expensively got-up book is the first of its kind ever published in England, and introduced the custom long before in vogue in France. It is marked as on sale in London without further address, proving that Tijou resided here and believed himself to be a well-known personage. The plates comprise, in addition to designs for royalty, those for Chatsworth, Burleigh, and Wimpole, with others impossible of execution in iron. The book was "for the use of smiths." Partridge, a London smith, seems to have borrowed one of the baluster designs for the library staircase of Trinity College, Cambridge, built by Wren.

In 1694 a heavy and unforeseen misfortune befell Tijou in the lamented death of his great patron the Queen. Work at Hampton Court practically ceased in consequence till the destruction by fire of Whitehall Palace in 1698 drove the King to complete it. The Fountain Garden was enlarged for eight additional fountains, and the beautiful screen was removed to the Privy Garden on the south front, then being laid out, where 832*l.* was apparently expended on masonry to receive it. The gates remained still to shut off the garden walks from the Park avenues, and the balustrade for the king's staircase, designed five years before, was ordered from Tijou. This enlargement of the garden and removal of the screen necessitated 1,442 feet of new iron rails with 172 panels for both sides of the Fountain Garden, which were designed by Talman, clerk of the works, who also estimated the cost at 2,132*l.* 16*s.*, at 5*d.* per lb. Tijou undertook the work, but charged 3,675*l.* for it, and a balance of 1,889*l.* 1*s.* 6½*d.* became the subject of appeals and petitions. It was unpaid when William III. died in 1702, and Anne, who cared little for Hampton Court, was loath to pay her own bills, much less those of her predecessors. Tijou enjoyed no more royal patronage, and Talman was not the man to pass such an overcharge. Other existing works of his seem to be gates at the Clarendon Press and Bridewell, similar to those of the triple arch, an entrance to Burley-on-the-Hill, and part of the work at Drayton House.

His work in St. Paul's is well known. It commenced as early as 1691, with windows for the choir at 6*d.* per lb. which were made at Hampton Court and brought to London. All the panels, screens, altar-rails, choir-gates and balusters, in which embossing is extensively used, are by him apparently aggregating to a total of between 4,000*l.* and 5,000*l.*, and extending over a period of nineteen years. His work finished in 1711, when he pressed to have his account settled in terms which make it appear that he was not in easy circumstances after twenty years of work. He left the country leaving his wife to collect the money and follow him, the family tradition says, broken-hearted. At St. Paul's the plainer work was only given subject to competition with two English smiths, one of whom undersold him. He probably went to Paris to dispose of his copper-plates and designs to a celebrated smith named Fordrin, who later published them in his own name. He is reputed to have worked at Canons, but if he commenced there he must have abandoned the work, leaving it perhaps to his assistants.

That Tijou was an artist of the first rank in his day can never be disputed. He must certainly have executed the masks and finer embossing with his own hands, for it is by a master. It is also clear that he set out his own work, for a joiner is paid for glueing boards for Mr. Tijou to draw the iron screen upon. We may reproach Tijou for redundant richness, and that the actual smith's work is little more than material to hang his foliage on. He was clearly an artist and an embosser, but never a practical smith, as is evident from the designs he published.

The credit of the work has been assigned to Huntingdon Shaw, a smith of Nottingham. There is no evidence to sustain such a claim, which rested solely on the inscription on a monument in Hampton Church, and it has been conclusively demolished. We may, however, believe that the tradition had some basis of fact if we please, for Tijou must have had a working foreman, his works were for a time at Hampton Court, and Shaw's death in 1710 almost coincides with Tijou's relinquishing business. Shaw was never either a master craftsman or designer, and as far as actual proof goes there is none whatever that he was even a smith. His statue nevertheless adorns the new Victoria and Albert Museum as our only representative of smithcraft, though an official inquiry made by the Board of Education had demonstrated long before that Shaw's name is nowhere recorded in connection with any ironwork at Hampton Court or elsewhere.

I have dwelt at some length on Tijou, for whatever we may think of his work, and no one visiting St. Paul's can deny that it is appropriate and beautiful, he alone raised smithcraft from the lowest level into a flourishing craft patronised almost immediately by royalty, and almost the entire aristocracy of the country. As to his designs, most are essentially in the French taste of Louis XIV.; but when executed the work becomes something different. Whether modified by the taste of the patron or the architect with whose buildings it is so generally associated, it appears, as I am pleased to think, more English in design, less grandiose and assertive, stronger and more practical.

We have some ground for believing that Tijou's very florid ironwork was not to Wren's taste, and, therefore, that he was no willing patron, for while he extols Grinling Gibbons in his memoirs, he is silent as to Tijou. This is strange afte an association of twenty years. Tijou similarly ignores Wren in the dedication of his book of designs; he sent his estimate and bills direct both to the Crown and to the cathedral authorities, and the indoor work at Hampton Court, such as woul naturally be left in Wren's hands, like the balustrades to the King's and Queen's back staircases, the Privy stairs, Lor Portland's and others, are as plain as can be, with no trace of the beaten leaf work of which Tijou was so lavish.

When Tijou disappeared his apprentices, assistants smiths, or whoever he employed must have remained Whether he actually brought any foreign workmen with him is unknown, but none are heard of after his departure. Presuming Shaw to have been his foreman of works, he, too, ha departed, and the road was clear for successors. The onl work in the Home Counties, however, that can certainly b tributed to a pupil is a pair of gates made for Canons, and ow at the Durdans. They are designed after Tijou's style, it not carried out by a masterful hand.

*(To be concluded.)*

## COMMENTS ON ARTESIAN WELLS.

By F. J. WARDEN-STEVENS, M.I.M.E., A.M.I.E.E.

N view of the large number of artesian wells which have been bored comparatively recently in the London district ) provide independent or private water supplies, some com- ients on mechanical details may be opportune. Artesian ells are here intended to include deep borings and not sunk ells, and where the water level is at a considerable depth rom the ground surface, so that the pump has to be lowered ito the boring and worked by rods from gearing at the ground irface.*

In order to decide upon the diameter of a well boring, the rst question to consider is the pump, as it has to be lowered ito the boring. Upon the size of the pump and the quantity f water required will depend the diameter of the boring.

A pump for a deep well boring is essentially a slow-speed nd long-stroke pump. A good average length of stroke is hree feet, although this depends to some extent upon the ize of the pump; the average speed is about 80 to 120 feet er minute, and it is generally inadvisable to increase this peed much more on account of acceleration forces. Allowing 00 feet per minute as being the speed, then 50 cubic feet per iinute is the maximum delivery of the pump per foot area of he pump bucket, or allow about 300 gallons per minute.

Now, of course, the diameter of the lining tubes of the oring must be larger than the diameter of the pump, to allow or the thickness of the barrel and clearance; for example, pump with an 8-inch diameter barrel will require a boring ith about 10-inch diameter lining tubes, and the size of the ising main will be about 8 inches diameter.

The depth the boring will be required to be extended to is lways an uncertainty. A depth of water in the boring of at east over 100 feet is desirable, and allowance must be made ) facilitate increasing the depth or extending the lining ubes should circumstances require it. The depth of the ning tubes, if the source of the water supply is the chalk, hould preferably extend several feet into the solid chalk, nd in any case below the pump suction pipe.

The guide pipe driven into the subsoil at the starting of he boring should extend sufficiently far to shut out all surface r subsoil waters, and to act as a protection to the lining ubes.

The lining tubes for the boring are a most important part f an artesian well. Lap welded steel tubes of only the best uality should be used, and of ample thickness, to prevent uckling when being driven. The ends of each length of tube hould be faced, screwed with a fine thread and butt to make tight joint in the connecting sockets. If the ends of the ubes do not properly butt at the joint, when the tubes are riven the threads will be damaged, which may result in ercolation of undesirable water into the boring.

As regards the pump, the barrel, which is screwed at one nd into the suction pipe and at the other end into the rising iain, should preferably be of brass, of ample thickness to ithstand wear for a reasonable time, its length being, of ourse, rather longer than the length of the stroke.

The valves of the pump, as will be understood, require articularly careful construction, as it is important that they hould not require frequent attention, necessitating not only toppage of the supply, but considerable time and trouble in isconnecting the rods and withdrawing the bucket and valves. he suction valve and its seating are usually so arranged that ey can be removed from the boring by a screwed rod. The ump rods are sometimes of hard wood, the advantage of such eing particularly the reduced weight, as a considerable length required. It may be here noted that the pump should be sually placed at least 50 feet below the normal water level, allow for the water level falling during pumping.

As to the driving gear and power at the ground surface, here is the opportunity of a varied selection of arrangements. f steam is already available for other purposes, the direct-acting steam drive is certainly simple. Again, if hydraulic power is available, say in cases where there are hydraulic lifts, the hydraulic direct drive is both simple and practically noiseless, although perhaps the working cost is generally rather higher than with most other types of gear.

Other arrangements which may be mentioned are the electrically driven gear, the worm and wheel type of which, as well as the machine-cut double reduction gear, are very compact and also practically noiseless. Then, of course, there is belt-driven gear from shafting or engine available.

Another question of no little importance in view of satisfactory pumping from artesian wells is that of balancing. It will readily be understood that, apart from the weight of the pump bucket and rods, especially if the latter are of iron, there is the weight of the column of water in the rising main on the up-stroke. On the down-stroke, of course, the valve is open and the water is not acting on the bucket. The power to be exerted, therefore, is not uniform, and it is to be remembered that the weight has to be set in motion and stopped each stroke. The power can only be equalised by balancing all moving parts. There is, however, still the difficulty with the variation of water level.

As regards the question of air lift for the water instead of the use of a pump, this is certainly attractive. The air lift, briefly described, consists of two tubes suspended down the boring, compressed air being conveyed down one tube and forcing the water up the other tube. The great advantage of the air-lift system is that no pump is necessary in the boring, with its accompanying working parts, valves, &c., and, of course, no pump rods or gearing are required, only the air compressor at the ground surface driven by a suitable source of power. It must also be mentioned that the output of an artesian well may be greater with air lift than with a deep boring pump. The cost of working, however, may be said to be higher with the air lift, and a considerable noise results from the working of the air compressor.

A detail apt to be neglected in connection with artesian well gear is that of lubrication. All bearings should have an oil pipe conveyed from a syphon or regulated sight-feed lubricator; in the case of moving parts, such as connecting-rod ends, an oil box with dip catcher should be provided.

In concluding, note perhaps should be made regarding facilities being provided for easy removal of the pump rods to get at the valves. Three-leg tackle and gear with winch should always be available, and there must be sufficient head room in the pump house to allow of withdrawal of the rods. There should preferably be an elevated guide beam in the pump house over the centre of the boring, with a platform a few feet below to facilitate handling of the rods.

These comments on some of the important mechanical details relating to water supply from artesian wells will, it is hoped, be of interest to many who are no doubt considering the advisability of obtaining such a supply. It will be noticed that no reference has been made to the geological considerations in connection with the subject, which, whilst of no less importance, are outside the scope of these comments.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

ON Thursday evening, January 13, at a meeting of the Society, Professor S. D. Adshead, of Liverpool, introduced the subject of town planning with special reference to the Housing and Town Planning Act and its bearing upon suburban dwellings.

Professor Adshead in discussing the Act pointed out to what extent the exercise of goodwill and tact on the part of those concerned in negotiations would be required for its satisfactory administration. He urged the necessity for a unity of purpose and warned against the danger of isolated areas being "town planned" without due reference to the whole, a possible result of a too literal reading of the Act. Town planning had in the past been largely responsible for the tastes and inclinations of the working man. He was, unless taken in hand by his employer, either driven into a slum or catered for by the speculating builder, whose taste was the very worst.

What could town planning do for him?

With improved communications there was no reason why working men should not, if they so desired, live outside the town where land was plentiful and cheap and the pleasure of a garden could be enjoyed. So long as town dwellings were adhered to, these should be on the block system—an arrangement adapted in many ways to modern conditions. Concerning

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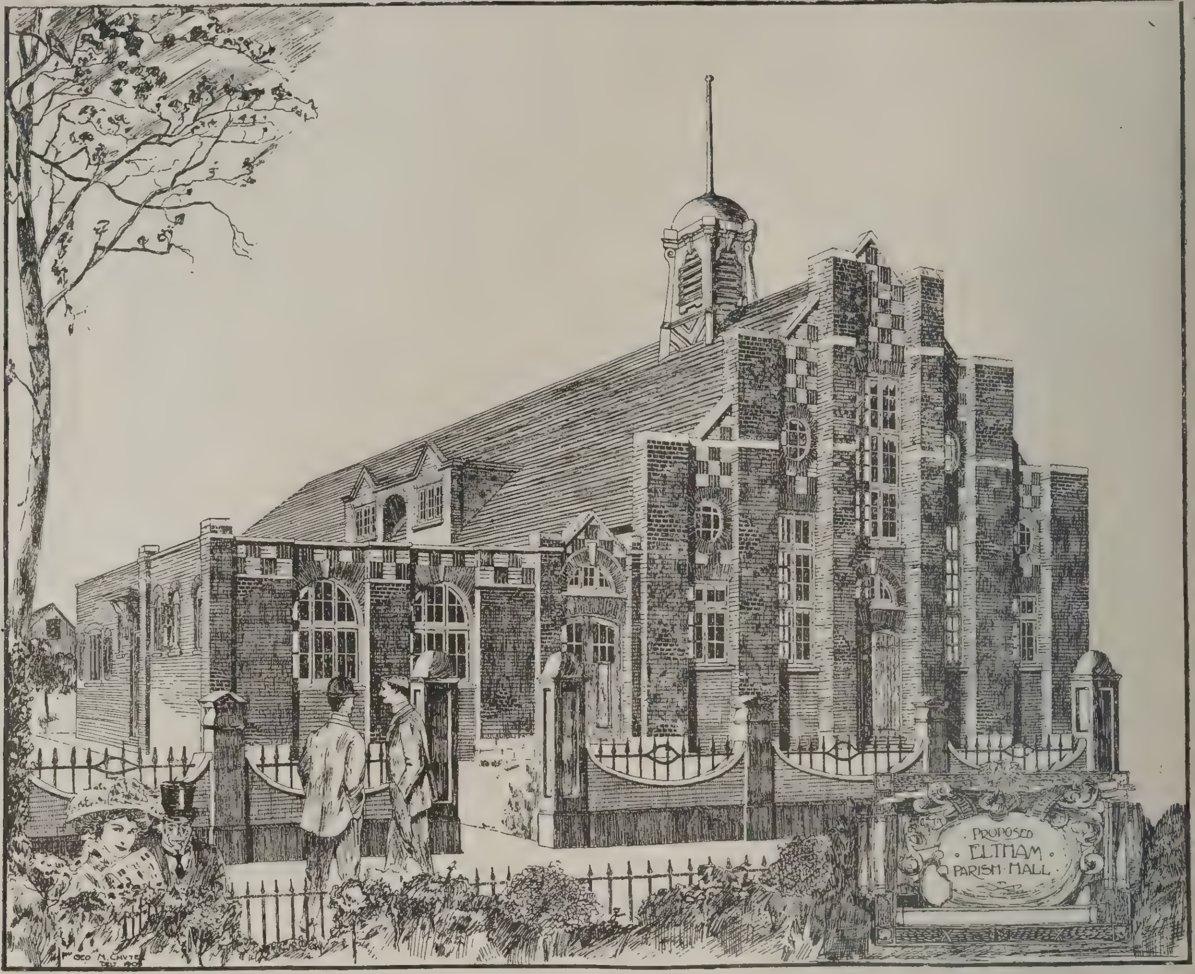
* [An "artesian" well, properly speaking, is one in which the ater rises to the mouth of the well, without pumping, but the rm has now become very generally used to mean tube wells of onsiderable depth.—ED.]



COMPETITION DESIGN by REGINALD PYWELL and GEORGE N. CHUTER, Joint Architects.

the middle classes, here again a lack of appreciation of real art had rendered them a ready prey to the speculating builder, who while conforming to the by-laws had produced monotonous rows of cubicles which attracted the unsophisticated with a thin veneer of respectability in the shape of sham ornament. The individual building owner had attempted to make his building the climax of the street. Self-assertion had been unchecked. Thus, the Town Planning Act was destined to become one of the most important and consequential of all recent reforms.

For the future a new beginning was impossible, we must make the best of what we possess. Terraces could be with little alteration converted into blocks of tenements, while stripped of its "ornament" the mid-Victorian house might even attain to a stuccoed simplicity. The chief opportunity for real development, however, was offered by the outer ring of undeveloped land extending beyond our suburbs. Here, the choice of a suitable and utilitarian style for future buildings suggested wide possibilities. There was much to be said for the pedimented villa of the Regency and Early Victorian periods, the fine simplicity of which, combined with its compatibility with modern needs must appeal to the increasing artistic intelligence of the people.

Referring to recent examples of suburban development, Professor Adshead pointed out that they must by no means be regarded as final results but as experiments in a far-reaching movement. There was much confusion of refinement with rusticity; these did not go necessarily hand in hand; the magnificent cottage did not suggest the residence of pretension; there was a limit to the stretching capabilities of the rustic cottage. In planning the residential quarter of a town, the occupation and taste, the tendencies either rusticated or refined of its prospective population must all be equally considered, and a disposition and an architecture evolved at once utilitarian, harmonious and beautiful.

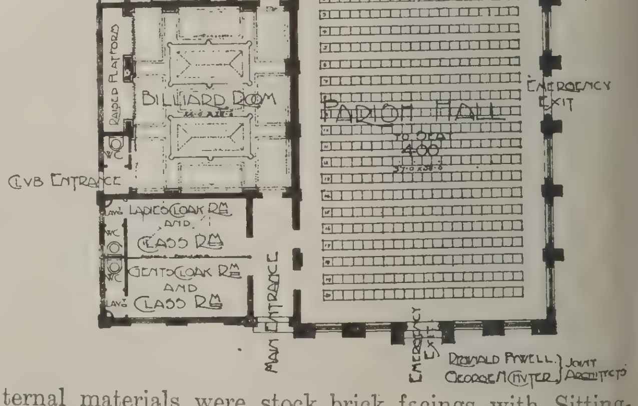
The lecture was illustrated by plans and views having reference to town planning both in this country and abroad.

A vote of thanks was accorded the lecturer on the motion of Councillor Boyle, and a discussion ensued in which Messrs. Percy Robinson, S. D. Kitson and Butler Wilson joined.

The next general meeting of the Society will be held on Thursday, January 27, when J. A. Gotch, F.S.A., F.R.I.B.A., will discuss "The Elizabethan House, as Illustrated by Contemporary Architectural Drawings."

## ELTHAM PARISH HALL.

THIS design was submitted in the above recent competition. The conditions asked for a hall to seat 400, separate cloak-rooms for ladies and gentlemen, which could be used for two class-rooms, or be converted into one room for small parochial meetings; billiard-room, kitchen, and heating chamber, &c. The proposed external materials were stock brick facings with Sittingbourne red dressings and Bath stone bands and copings, the roofs to be covered with sand-faced tiles. The internal walls to be faced with Flettons and distempered; all internal joinery to be stained green. The authors of the design were Mr. REGINALD PYWELL and Mr. GEORGE N. CHUTER.



## PENSHURST AND THE SIDNEYS.*

EN—the Celtic word for high—remains in many place-names, and in the same sense it was applied to an exalted rsonage, as the Pendragon. The earlier name of Pennas- rst, Pencahurst, or Penshurst, was Pencestre, Pencester, Penchester, and would indicate that the Celts had reared earthen camp or castle on the hill; but as ages passed and ature spread her forest, the castle gave place in importance the wood or hurst. As Penchester, however, it was still own in the reign of Henry the Third, and one of his knights, r Stephen de Penchester, whose ancestors had held the operty from the time of the Conquest, was allowed to re-edify e manor house; and being constable of Dover Castle and rden of the Cinque Ports, he acquired great fame in the ys of the first Edward. Sir Stephen, who occasionally re- led at his castle at Allington, died in 1299, and having no to succeed him, bequeathed his "manners" to his ughters, Joan and Alwys (or Alice).

On the marriage of Alice de Penchester, Penshurst passed her husband, Sir John de Columbers, and their sons, Thomas d Stephen, in 1338 sold the manor to Sir John de Pulteney, important citizen of London; and three years later, by ters patent of Edward the Third, he was licensed to engthen the residence with walls of chalk and stone and battle it, and it is stated that the king became his guest en on his way to Tonbridge. Again and again the bells the City churches made mad music in the air when four nes in succession John de Pulteney was proclaimed Lord ayor of London. He died in 1360, and from John Stow learn that he was a draper, and in 1337 built a fair chapel St. Paul's Cathedral, wherein he was buried; that he nded a college in the parish church of St. Laurence, called ultney after him; built the church of Little All Hallows Thames Street; the Carmelite Church in Coventry; and ve relief to prisoners in Newgate and the Fleet, besides ing other charitable acts.

His son, Sir William, dying, the mother's second husband, Nicholas Louvaine, became possessed of Penshurst. cholas, their son, died without issue, and his widow married hn Devereux, who had fought with Edward the Third. By chard the Second he was made knight-banneret, was ap- inted steward of the king's household, and in 1393 Richard ensed him to further fortify Penshurst. He died in 1394, d on his wife's death the property again passed to the uvaines. Later, by marriage, Sir Philip St. Clere of tham became the owner, and his son John sold the manor John, Duke of Bedford, third son of Henry the Fourth.

The Duke enlarged the house, and this would be the time became known as Penshurst Place (or Palace). In 1422 brother, Henry the Fifth, died, and he was appointed gent of France, and martyred the Maid of Orleans, recently tified. His death in 1435 caused the loss to us of France.

The next owner of Penshurst was the late Regent's brother, mphrey, Duke of Gloucester (Humphrey the Good), who ring the minority of Henry the Sixth was Protector of Eng- nd, but owing to his opposition to the king's marriage with rgaret of Anjou he was arrested in 1447 and, it is believed, assinated. He built the Divinity Schools at Oxford, and nded the library from which the Bodleian arose. He lies the cathedral of St. Albans.

Penshurst passed to Henry the Sixth, and he at once nted the manor to Humphrey Stafford, Duke of Bucking- n. In 1460 he fell in the Wars of the Roses at the battle of rthampton. His son Humphrey having been killed at battle of St. Albans, his grandson Henry inherited the e and estates, and in 1483, mainly through his agency, hard the Third was placed on the throne; but favouring nry, Earl of Richmond, who became Henry the Seventh, was beheaded at Salisbury. His son Edward succeeded the estates and title; and on a charge of treason against nry the Eighth he was executed on Tower Hill in 1521, and property again reverted to the Crown; and at this time nry the Eighth and Anne Boleyn rode there from Hever tle.

By Edward the Sixth Penshurst was granted to John, Earl Warwick, and later to Sir Ralph Fane, who, charged with g an accomplice of the Duke of Somerset, ended his life Tower Hill in 1552. Edward then granted the estates to yr William Sydney," whose ancestors had lived in fair rmandy, and in the time of Henry the Second owned the nor of Sutton. He had fought at Flodden Field, and was sent at the meeting of Henry and Francis on the field of Cloth of Gold, and became chamberlain and steward of household of the young King Edward.

Sir William died within the year, and was succeeded by his son, "Sir Henrie Sidney," chief cupbearer to Edward the Sixth. In 1551 Henry had been privately married at Esher to Lady Mary Dudley, daughter of John Dudley, Duke of Northumberland, Earl of Warwick, and Baron Lisle; and later the union was publicly solemnised in the church of St. Ethelreda, Ely Place. In right of his wife he used the badge the bear and ragged staff with the Sidney crest of the porcupine. In his arms Edward breathed his last in 1553, and he it was who caused the statutes of the realm to be first printed.

In 1554 Philip Sidney was born, and the acorn planted in the park in honour of his birth inspired the strains of Ben Jonson and Edmund Waller. Southey deplored that it had fallen to decay; Gifford records that inadvertently it was cut down, and Zouch gives the date 1768. This seems to be correct; and to the neighbouring Bear Oak the memory of Philip Sidney has been popularly transferred, though the Hon. Mary Sidney states it was an old oak when Philip was born.

In 1566 Mr. Philip Sidney paid his first visit to his "uncle of Leicester" at Kenilworth Castle. His father, as Deputy of Ireland and Lord President of Wales, during many anxious years did splendid work in quelling the ever-recurring rebellions, and spent his fortune doing so; yet, although we may believe the tradition that Elizabeth visited him at Penshurst, he was never quite in her favour; but when she complained of his extravagance, Philip went to her at Oatlands and successfully refuted the charges. In 1578 Sir Henry resigned his office in Ireland, and with his wife and Philip he is believed to have spent some time with the queen at Hampton Court.

Philip was knighted in 1583, and in the same year he married Frances, daughter of Sir Francis Walsingham, and they often visited his wife's parents at Barn Elms. What need to recount his story as student, cleric, poet, traveller, courtier, politician, ambassador, and soldier! His acts are known to all, for, as William Camden wrote, he was "the glory of the world." Campbell describes his life as "poetry put into action," and Oldys catalogued two hundred authors who had written in his praise. In 1585, under his uncle, the Earl of Leicester, Elizabeth sent him to the Netherlands to aid the Dutch against the Spaniards. Sir Philip held a commission as Governor of Flushing, and there he heard of his father's death; and three months later his mother died, and he never returned to England as owner of Penshurst Place, for six weeks later he received a wound in his leg which caused his death. Never will the incident be forgotten how, when weak from loss of blood, he was raising a borrowed flask to his lips, but seeing a wounded soldier he passed it to him, saying, "Thy necessity is greater than mine." He was conveyed from Zutphen to Arnheim, where after nearly a month's suffering he peacefully passed away (October 17, 1586), true to his Maker and his queen. The body was embalmed and brought to London in his own ship, "The Black Pinnace." The coffin was landed on Tower Hill and was conveyed to a house in the Minories, where, owing to an informality in his will, it remained for three months. Finally he was buried in the lady chapel of St. Paul's Cathedral, more than seven hundred mourners taking part in the procession. Not until after his death was his "Arcadia" published; his first known work was a masque performed at the Earl of Leicester's house at Wanstead (April 1578) in presence of the queen.

Philip had bequeathed his estates to his brother Robert, who took part in the engagement at Zutphen and was knighted by his uncle. For twenty-eight years he was Governor of Flushing, and while he was abroad Ben Jonson records how his wife, Barbara Gamage, entertained King James at Penshurst. In 1606, by James the First, he was created Viscount Lisle; some ten years later he became chamberlain to the queen consort, and in 1618 he received the title of Earl of Leicester. He died in 1627.

His only surviving son, Robert, had been married to Lady Dorothy Percy, daughter of Henry, Duke of Northumberland, and among their children were Philip, Algernon, Robert, Henry, and the beautiful Lady Dorothy—the "Sacharissa" of Waller—called in the family circle "Doll." She married Henry Lord Spencer, later Earl of Sunderland, who fell at the battle of Newbury.

After the execution of Charles the First, 1649, his two youngest children, the Duke of Gloucester and the unfortunate Princess Elizabeth, were confided to the care of Lord and Lady Leicester at Penshurst, and they remained there for over a year. In 1667, in his eighty-second year, the old Earl died, and his son Philip succeeded to the title and estates.

Algernon in 1645 had been appointed Governor of Chichester, and two years later of Dover Castle. He became a member of Parliament, travelled abroad, and returning aided his friend William Penn in drawing up a plan of twenty-four

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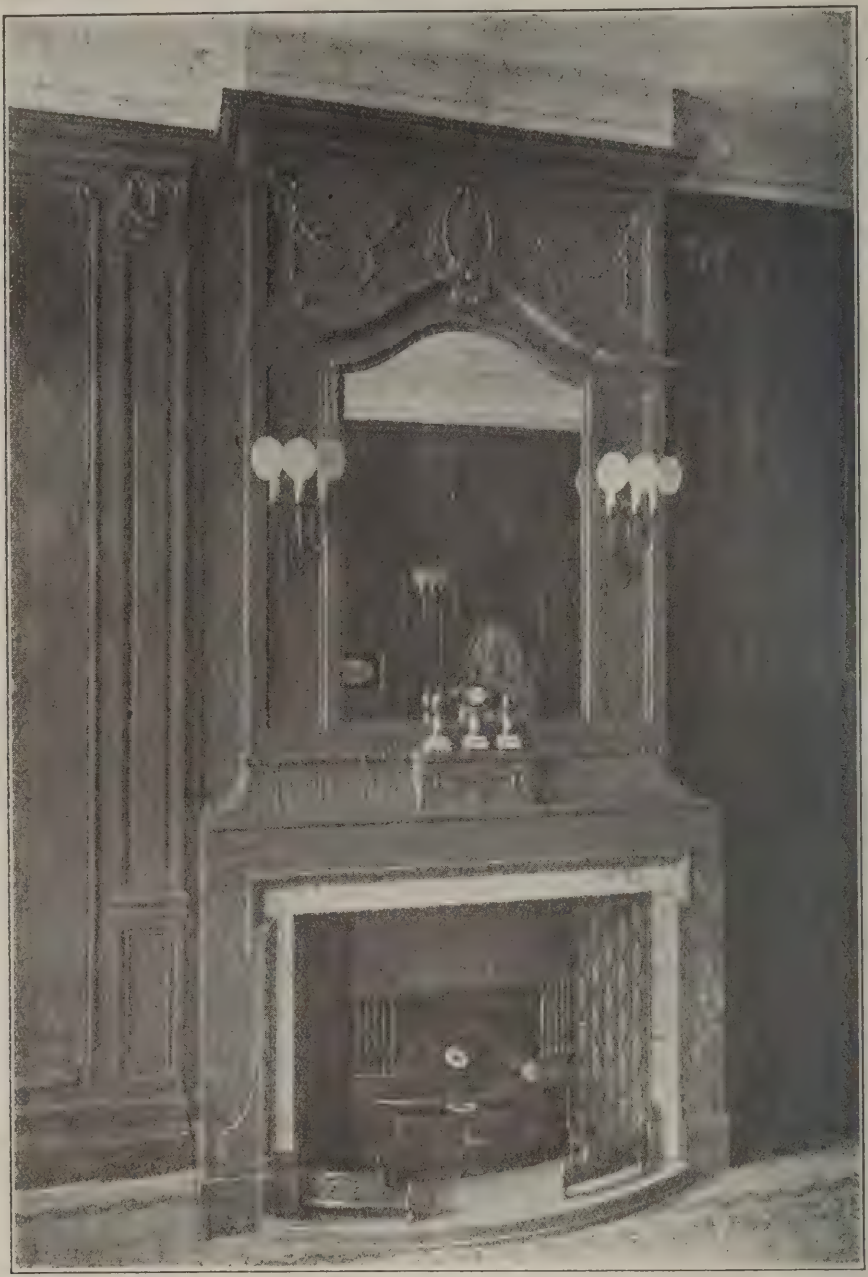
[*] A paper read at a meeting of the Upper Norwood Athenæum Mr. Charles Wheeler.

## MODERN EUROPEAN ARCHITECTURE.

### HOLLAND.



[From *Het Huis.*

MANTEL IN HOUSE, HEERENGRACHT, AMSTERDAM.

articles for the Government of Pennsylvania. Various charges, possibly without foundation, from time to time were brought against him, and in 1683 he was arrested as one of the members of the council of six concerned in the Rye House plot to assassinate Charles the Second. Judge Jeffreys, denying him the aid of counsel and not permitting him to call any witnesses, sentenced him to death, and his head fell on Tower Hill.

Few in those days were contented to live in peace, and Algernon's brother Henry was one of the principal promoters of the rebellion against James the Second in 1688, and from Ladye Place, where he had been in hiding, he went to William of Orange inviting him to invade England, and he received him on his arrival. William showered honours on him, and in 1694 created him Earl of Romney; and while Master of the Ordnance he introduced his own arms, the pheon or broad arrow, as the Government mark. He died in 1704 and was buried in St. James's Church, Piccadilly.

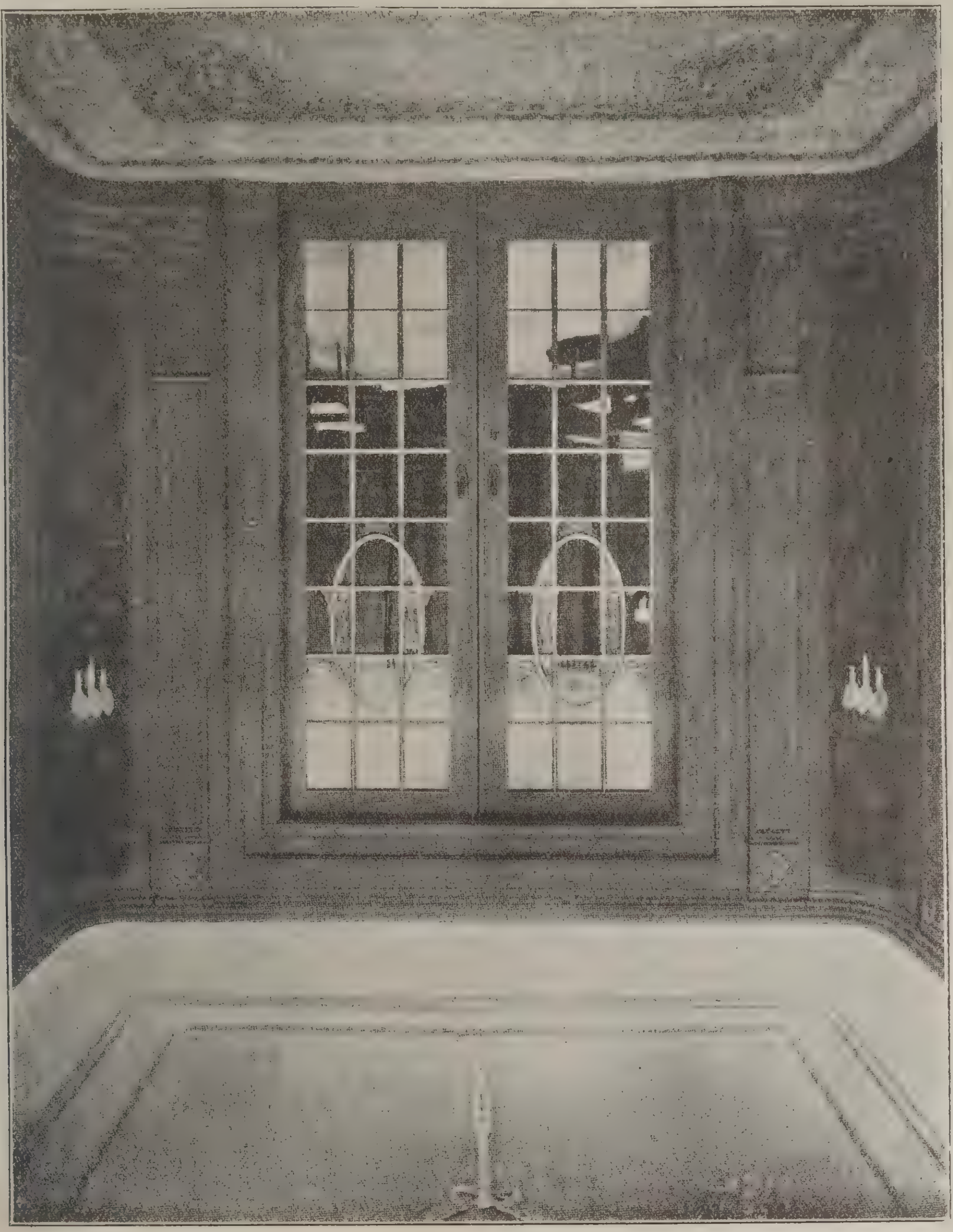
Philip, Earl of Leicester, had died in 1697 at the advanced age of eighty, and was succeeded by his son Robert, three of whose sons, Philip, John and Joceline, successively succeeded to the title, and on the death of Joceline in 1743 it became extinct.

Penshurst passed to Joceline's niece Elizabeth, who becam the wife of William Perryng or Perry, and in 1752 Georg the Second granted permission for them to assume the nam and arms of Sidney. Their daughter Elizabeth married Si Bysshe Shelley, and their son, Sir John Shelley, in 1793 b sign-manual of George the Third took the name and arms Sidney. His son Philip Charles in 1835 was created Baro de L'Isle and Dudley by William the Fourth, and he marrie Sophia FitzClarence, a daughter of the king. His son Phili succeeded to the title and manors, and his son Philip, wh married a daughter of Viscount Gort, is the present Lord L'Isle and Dudley and Master of Penshurst; and it may mentioned that among Royal guests at Penshurst was Edwar the Seventh when Prince of Wales.

John Carter in 1803 read the story of Penshurst Pla from its stones and bricks, and various portions of the arch tecture he ascribed to the reigns of Henry the Second, Richa the Third, Henry the Eighth, Elizabeth, James the First, a the first and second Georges. To the less trained eye, howeve the falcon and ibex of the Duke of Bedford, the broad arro of Sir Henry Sidney, his later bear and ragged staff and t porcupine, and the Gamage griffin, besides various inscri tions, fairly indicate how the building was from time to tin

## MODERN EUROPEAN ARCHITECTURE.

### HOLLAND.



[From *Het Huis*.

DOORWAY TO SALON IN HOUSE, HEERENGRACHT, AMSTERDAM.

nlarged; yet, though such a splendid and stately pile, foundations exist which show that portions have been swept away.

In 1863 John Henry Parker said it was a perfect example of a wealthy gentleman's house of the time of Edward the Third or A.D. 1341. The house, apart from the additions, was really perfect as originally built, only excepting the kitchen, which had been destroyed by fire, and probably some of the towers. The great hall remains almost unaltered, and such an open-timber roof and such decorated mouldings were not to be found out of England. The fine windows with their Kentish tracery, consisting of a square opening in the head, with foliation and with transome bars embattled, are unknown in foreign countries. In the centre of the hall is the original hearth or reredos, almost the only one remaining, and with its andirons or fire dogs. Although fireplaces and chimneys of the twelfth and thirteenth centuries are found in chambers, it was not customary to use them in halls till the fifteenth century, the smoke escaping by the open louvre in the roof. The tables and benches in the hall are among the earliest pieces of furniture in England, and the trestles or legs have every appearance of belonging to the time of Edward the Third. The daïs remains with the staircase eading to the solar or upper chamber, and by its side a door eading to the cellar, originally the lower chamber under the solar, or lord's chamber, where from a look-out he could scan the hall. At the lower end the music gallery remains with a fine specimen of modern panelling, shaped with axe and chisel. Under the gallery was the passage called the screens, with the porch or principal entrance at one end, and at the other the entrance to the servants' court at the back of the hall. Along the passage are the doors to the buttery, where the beer, cider, and other drinks were given out, and to the pantry, where the bread and dry stores were kept. The meat was brought direct from the kitchen. The chapel was usually near the daïs, but at Penshurst, according to Parker, it was probably destroyed in the days of Elizabeth.

The gateway tower, as the inscription records, was built by Sir Henry Sidney in 1585, and in the porch hangs the original key. Horace Walpole in 1752 wrote, "The apartments are the grandest I have seen in any of these old palaces," and everywhere pictures and other works of art abound.

In the pages' room, to quote the words of Horace Walpole, "are four great curiosities, I believe as old portraits as any existing in England—FitzAllen, Archbishop of Canterbury; Humphrey Stafford, first Duke of Buckingham; J. Wentworth; and John Foxle—all four with dates of commissions as Constables of Queenborough Castle. They are not very ill done. Six more are heads. Sir Edward Hobby, last but one of the constables, is said to have collected these portraits." Other noticeable paintings are a head of "Christ and the

Madonna," ascribed to Simon Memmi, 1340; "Madonna and Child," by Guido; "St. Peter," by Steenwick; "Sleeping Venus," by Titian; "A Female Head," by Giorgione; "Sir William Sidney," by Lucas de Heere; "Sir Henry Sidney"; "Edward the Sixth," by Holbein, and "John Dudley, Duke of Northumberland," by the same artist; "Lady Mary Dudley"; "Sir Philip Sidney" when twenty-three, and a second portrait of him, by Zucchero; his sister, "Mary Countess of Pembroke"—the Urania of Edmund Spencer—by M. Gerrard, and one of her by Marc Geeraent; Philip's special friend "Hubert Languet"; "Queen Elizabeth," by Zucchero, and one where she is dancing with her favourite, Robert Dudley, Earl of Leicester, of whom there is also a portrait by Gerrard; "Robert, Earl of Leicester, 1632," by Vandyke; "Philip, Lord Lisle," by Vandyke; "Charles the First on Horseback," by Mytens; "Prince Rupert," who for a time took refuge at Penshurst; "A Halt of Cavaliers," by Wouvermans; "Charles the First's son, the Duke of Gloucester"; "Nell Gwyn as Venus," by Lely, and one of her son, the Duke of St. Albans; "Henry Rich, Earl of Holland," by Vandyke; "Robert, Earl of Leicester," by Van Somer; "The Brothers Philip, Robert, and Algernon," by Dobson; "Dorothea" (Sacharissa), by Vandyke, and another by Hoskins; "Algernon Sidney," by Justus Verus van Egmont; and "Barbara Gamage, Countess of Leicester, with six of her children." The later portraits include "George the Third," by Gainsborough; "Queen Charlotte," by the same artist; and "William the Fourth," by Sir Thomas Lawrence. Pictures by Peter Thone (1560), Murillo, Guercino da Cento, N. Poussin, Rubens, and others, also adorn the walls.

Interesting too is the tapestry by Giles and John Gobelins and the frescoes by Vanderbrecht; and antiquaries linger by the black wooden cradle of the Duke of Buckingham (dated 1585) and his bridle; the bushel measure (dated 1601) and the large bell bearing the date 1647. Here too is the spinet, with black keys and white sharps and flats, made for Christiana, Queen of Sweden, in 1680; the old lamp which, as the oil was consumed, showed how the hours were passing; the glass chandeliers from Venice, given by the Maiden Queen, and a piece of her needlework let into a card table; the ebony cabinet, with panels by Polemberg, Berghem, Both, and Peters, presented by James the First; and the riding boots of Algernon Sidney; locks of hair of Sir Philip and Algernon Sidney, and Sir Philip's helmet and shaving-glass, and Robert Dudley's sword are also among the treasures of the house.

In old days Penshurst possessed the most valuable collection of armour in England, at least, but most of it was sold by Sir Joceline Sidney, who also disposed of the larger part of the library; and though there is still an important collection of historic documents in the hands of the family, Ireland had been allowed to arrange them, and through him many passed into the hands of private collectors, while others were offered for sale in London shops.

Penshurst Church was dedicated in honour of St. John the Baptist; the architecture is mainly Decorated and Perpendicular, though portions are believed to date from about 1200. It contains the mutilated effigy of Sir Stephen de Penchester (1299), and the altar tomb of Sir William Sidney. Many Sidneys are buried in the vault of the Sidney chapel, and Algernon's coffin with others having fallen down about seventy years ago, his remains are now contained in a small stone chest. There are brasses to the two wives and seven children of Walter Draynocott (1507), Pacole Iden (1514), Margaret, the infant daughter of Sir Henry Sidney (1558), and an unidentified one of the fifteenth century. Two ornate stone coffin-lids are also of interest.

Few families have made a greater mark in history than the Sidneys, and for many ages may they live and enjoy the rest and peace they have earned.

For many of the foregoing particulars I am indebted to the compendious and charmingly written story of "Penshurst," by the Hon. Mary Sidney; from the writings of John Timbs, F.S.A., William Howitt, the Rev. J. L. Ward Petley, M.A., and Mr. Frank Hird I have also gleaned, and for assistance given me I thank Mr. W. F. Harradence.

## COMPETITIONS.

Tralee.—In our issue of December 31 we stated that the first premium in the competition for a Carnegie library and technical school at Tralee had been awarded to Mr. J. Clarke, Liverpool. We have since been informed that it should have been announced as Mr. W. T. Clarke, A.R.I.B.A., Bank Buildings, 60 Castle Street, Liverpool.

## OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* devotes its last number of the past year to motor garages, of which it illustrates several examples, mostly belonging to private individuals. The Council of Fine Arts established by order of President Roosevelt has been abolished by a revoking order of President Taft, not it is said from want of sympathy with the object of the Council, but because the present President holds that any such bodies should be created by legislative action.

*La Construction Moderne* with its New Year's number gives a coloured plate of the interior of the Mosque of Omar at Jerusalem, after a water-colour drawing by M. René Binet, architect. Illustrations are also given of a private mansion at Amiens, of which MM. G. Antoine & Son are the architects.

*Zodtchy* has an excellent Christmas number with numerous illustrations of piquant and refreshing modern designs for various buildings, a school, a club house, a bridge, a convent, and some sculptured monuments.

The *Engineering Record* has an interesting article in description of "A Convenient Rack for Holding Drawings," by John H. Gregory, M.Am.Soc.C.E., in which is also advocated the use of typewriting for lettering plans. The application of the slide-rule to the calculation of reinforced concrete is the subject of a descriptive letter from Mr. Arthur W. French, of the Worcester Polytechnic Institute.

The *Architectural Record* is devoted entirely this month to the work of Messrs. Carrère & Hastings, from their start in the several buildings at St. Augustine, Florida, to the present time. To understand modern American architecture it is essential to study the work of this firm and to note the influence they have exerted particularly in imparting the unmistakable French cachet that is now so prominent in the States.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### "Tenders" for a Surveyorship.

Sir,—Are your columns too austere for a wee little joke? The Thurles Urban District Council desire "tenders" from competent persons for the position of town surveyor, at a remuneration of 20*l.* per annum. It does not state how this munificent amount will be paid. Oh ye gods and little fishes! Who wants employment? Think of the possibilities and look at the position; fancy your card printed Mr. Job Hoof, Town Surveyor, Thurles.

I have not yet heard how many tenders were received.—Yours, &c., Hard Up.

## GENERAL.

Mr. Thomas Worthington, F.R.I.B.A., of Broomfield, Alderley Edge, and of Manchester, a former president of the Manchester Society of Architects, and a former vice-president of the Royal Institute of British Architects, who died on November 9 last, aged eighty-three years, left estate of the gross value of 13,907*l.*, of which the net personalty has been sworn at 13,747*l.*

The Auld Brig preservation committee at Ayr have been granted an extension of the time for completing their operations on the bridge to April 30. The extension was necessary on account of the frost having kept the work back.

Mr. Eustace L. Haynes, architect and surveyor, has removed his offices to more commodious premises at 120 Newgate Street, E.C. His telephone number is as before, Holborn 2390.

Mr. William H. Thorp has taken his son, Ralph W. Thorp, A.R.I.B.A., into partnership. The name of the firm in future will be William H. Thorp & Son, and they continue to practise as architects at Phœnix Chambers, South Parade, Leeds, as heretofore.

The ninth International Housing Congress will take place in Vienna from May 30 to June 2, under the auspices of the permanent international housing committee. A party of British delegates will be organised by the National Housing and Town Planning Council to attend the Congress.

Mr. W. J. Steele, deputy city engineer and surveyor, Bristol, was last week elected city engineer and town surveyor of Newcastle-on-Tyne.

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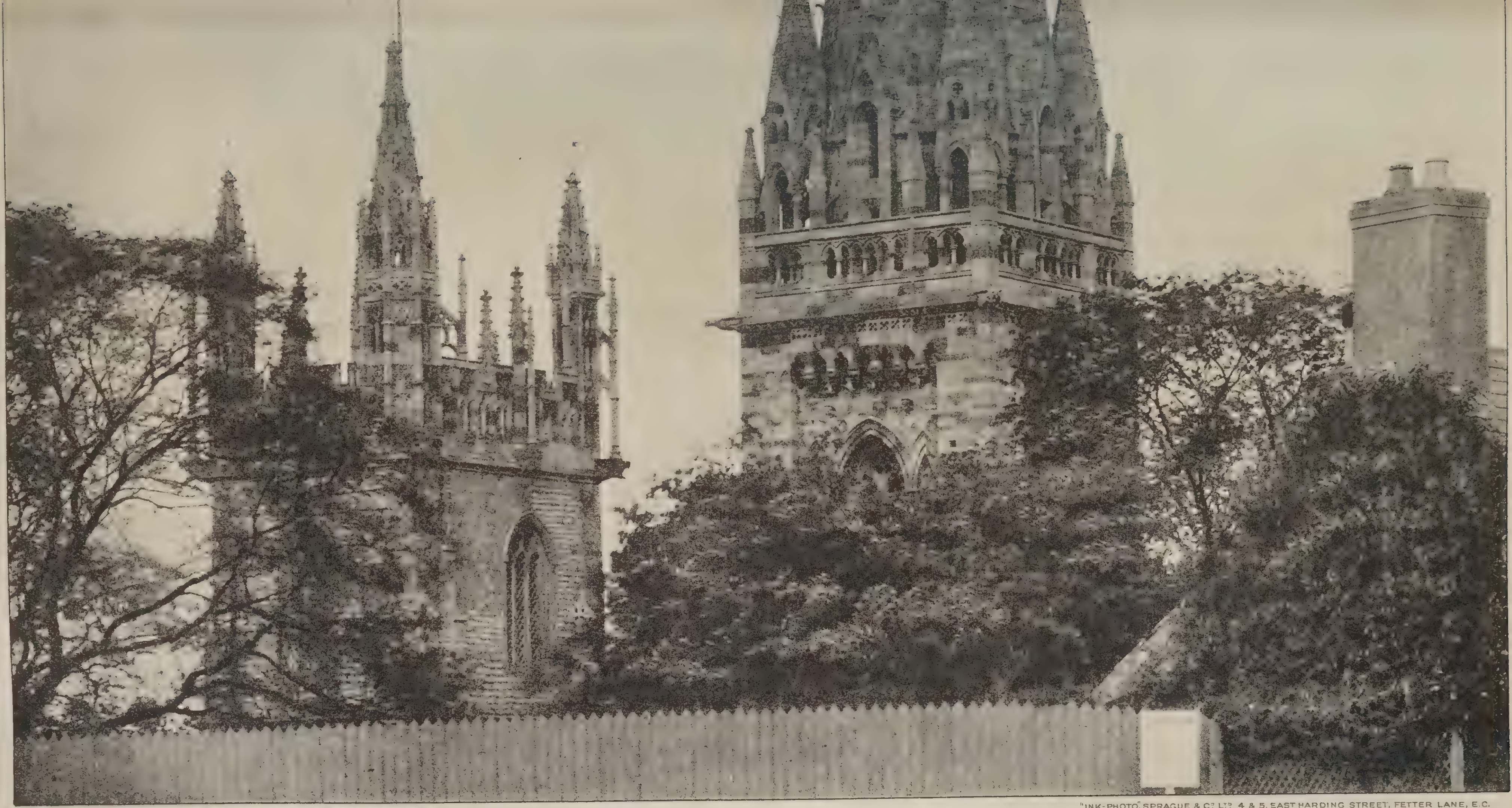

"INK-PHOTO" SPRAGUE & $C^o$ $L^{TD}$ 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

CATHEDRAL SERIES. No. 657.—LLANDAFF: WESTERN TOWERS AND SPIRE.

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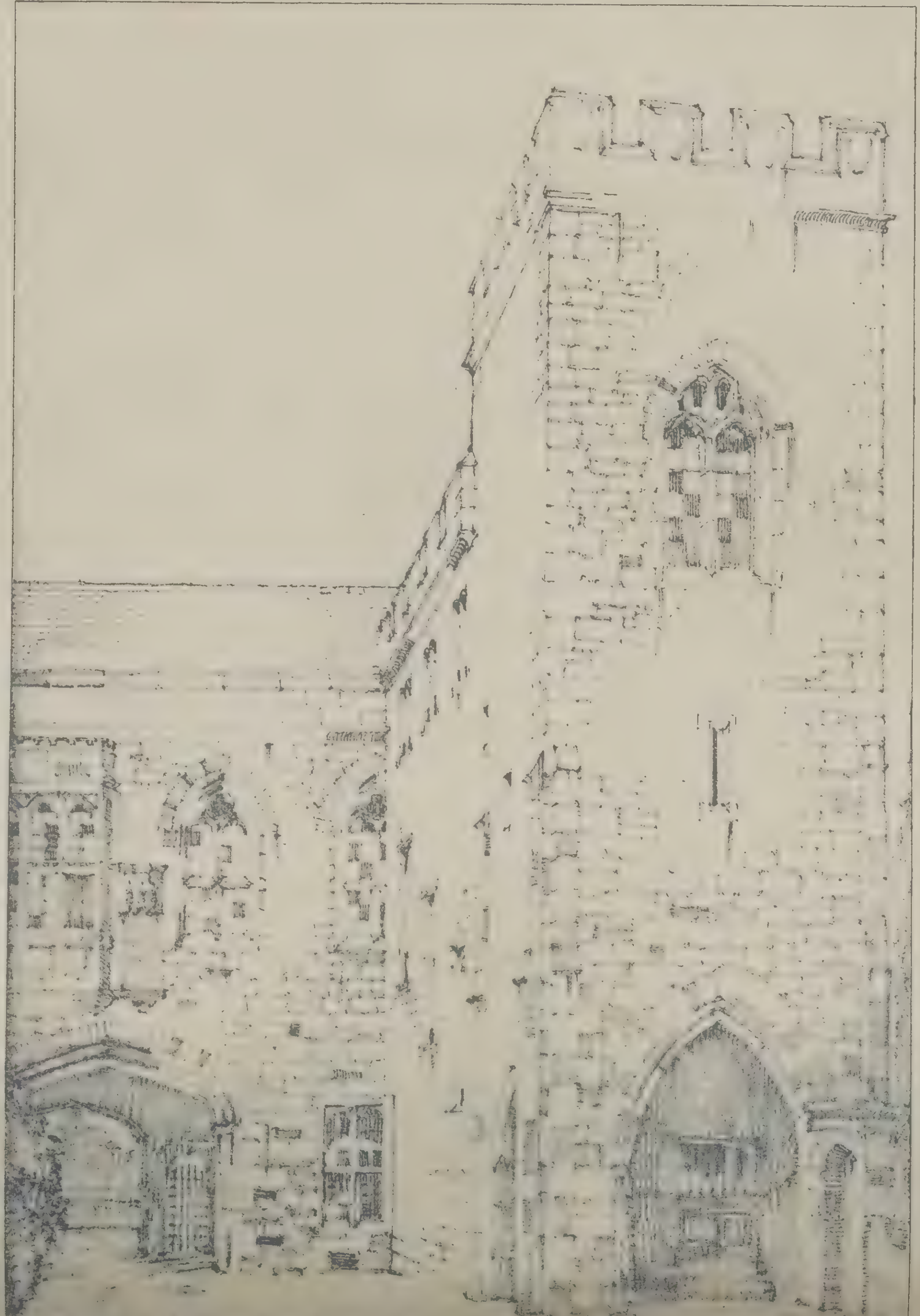
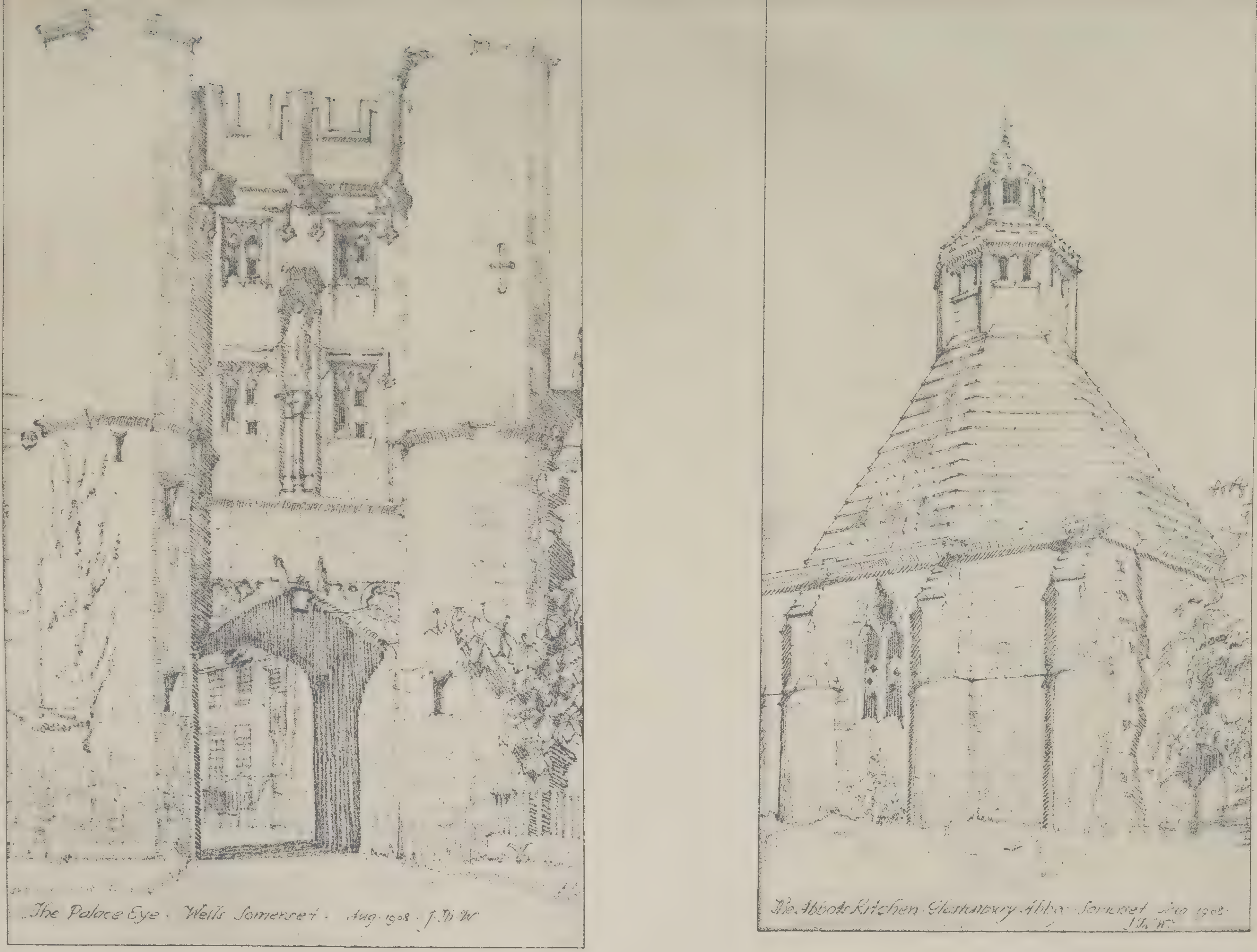
View of nave
Wells Cathedral Som.



Entrance to Vicars Close Wells

South-West Tower,
Wells Cathedral Som.



The Palace Eye · Wells Somerset · Aug 1908 · J. Th. W.

The Abbots Kitchen · Glastonbury Abbey · Somerset · Aug 1908 · J. Th. W.

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SKETCHES IN SOMERSET.

By JOHN TH. WESTBYE, Architect.

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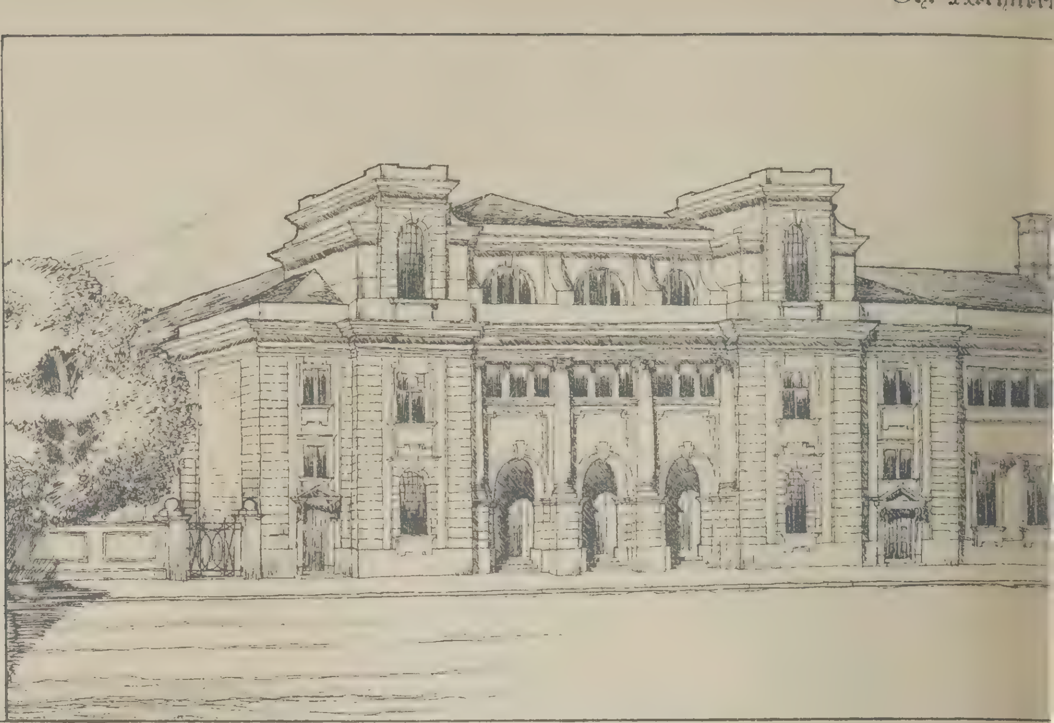

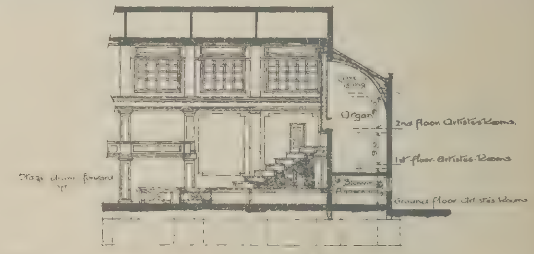

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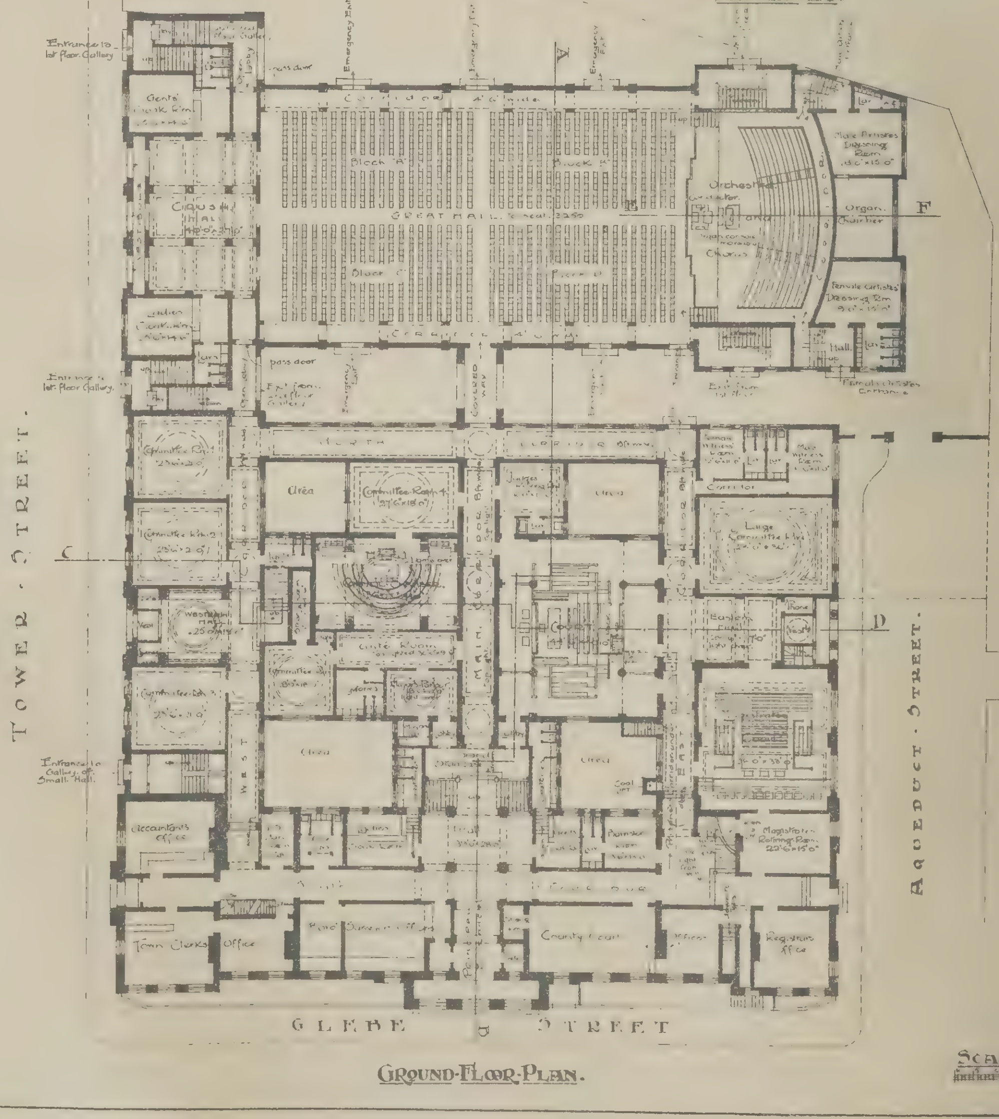
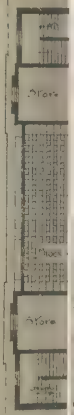


GROUND-FLOOR-PLAN.



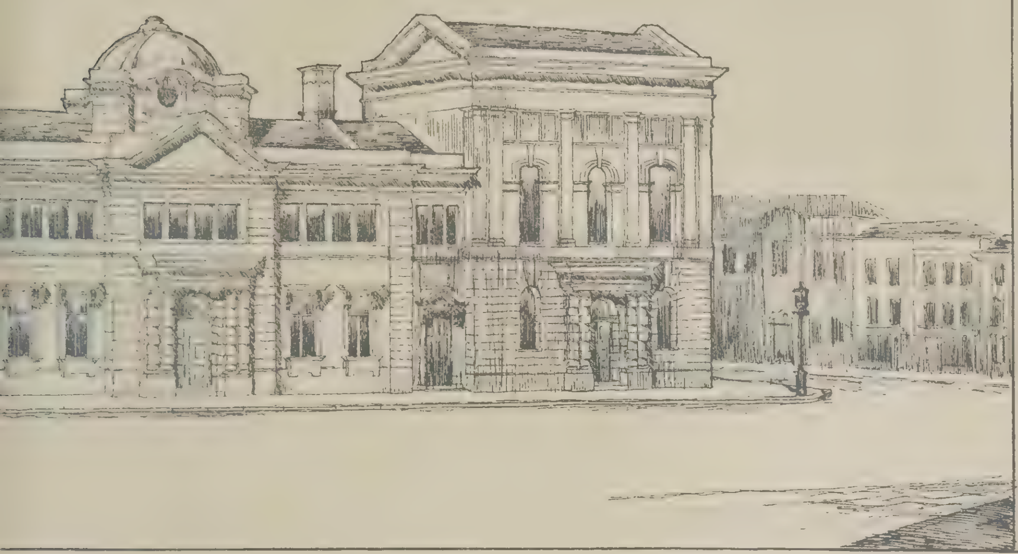
PLAN-
GR

PLAN-
2ND

SCALE·OF·FEET

COMPETITION DESIGN FOR ADDITION

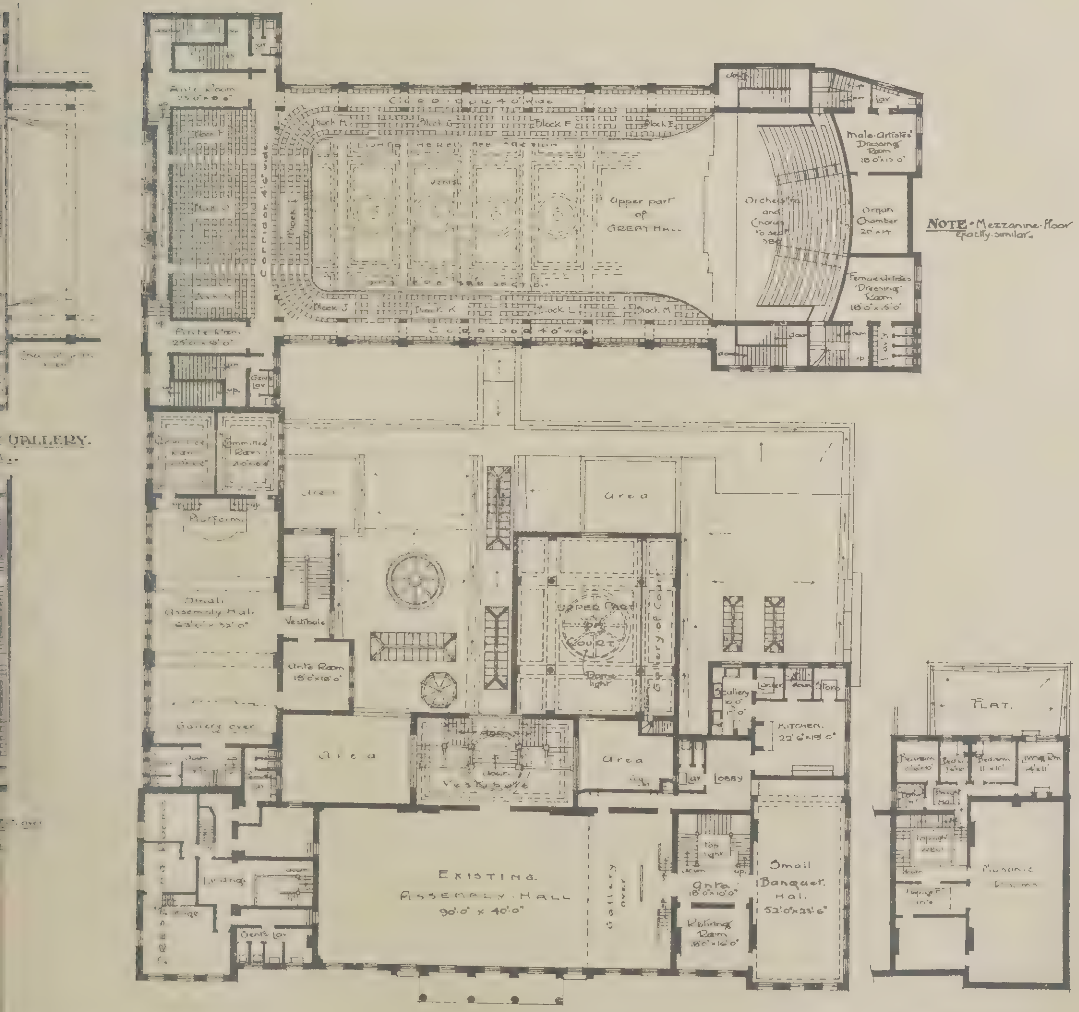
By A



### Accommodation of Hall.

| | | | | | |
|---|---|---|---|---|---|
| Block A | Ground | 340 | Block K | 1st Floor | 77 |
| B | | 340 | L | | 77 |
| C | | 340 | M | | 46 |
| D | | 340 | N | | 88 |
| E | 1st Floor | 46 | O | | 198 |
| F | | 77 | P | | 88 |
| G | | 77 | Q | 2nd Floor | 260 |
| H | | 77 | R | | 104 |
| I | | 90 | Orchestra & Chorus | | 380 |
| J | | 77 | Sundry seats | | 128 |
| | | 1804 | | | 1446 |

GRAND TOTAL 3250



**NOTE**—Mezzanine Floor exactly similar.

FIRST FLOOR PLAN.

SECOND FLOOR PLAN.

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TOWN HALL, STOKE-UPON-TRENT

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The Architect.

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## FORTHCOMING EVENTS.

*Saturday, January 29.*

The Royal Institute of British Architects : Annual Exhibition of Designs and Drawings submitted for the Institute Studentships at the Alpine Club closes.

*Monday, January 31.*

The Royal Institute of British Architects : President's address to students. Presentation of prizes and studentships.

Royal Academy : Course of Four Lectures on Sculpture, by Professor W. R. Colton, A.R.A. : (1) "On the Making of the Sculptor."

Royal Society of Arts : Cantor Lecture (3), "Textile Ornamentation," by Mr. Alan S. Cole, C.B.

*Tuesday, February 1.*

Northern Architectural Association : Paper on "Architecture on the Eastern Side of the Adriatic," by Mr. George Hubbard, F.S.A., F.R.I.B.A.

*Wednesday, February 2.*

Royal Archæological Institute : Paper on "Discovery of Early Wall-Paintings in Kingsdown Church, Farnham, Kent," by Mr. Philip M. Johnston, F.S.A., F.R.I.B.A.

Carpenters' Company : Paper on "The Joiner's Craft," by Sir Brumwell Thomas, F.R.I.B.A.

## EXHIBITION OF THE ARTS AND CRAFTS SOCIETY.

THE ninth exhibition of the Arts and Crafts Exhibition Society, and the last to be held at the New Gallery, now provides us with a further collection of the same type of design to which we have become accustomed as representing the art ideals of the members. In earlier days there was undoubtedly much that was crude and extravagant, but now, with the exception of a certain small amount of affectation of the defective technique of past ages, there is not much that one can regard otherwise than with satisfaction.

Of the various classes of exhibits, we are inclined to give the palm of excellence to the metalwork, whether it be wrought iron in the form of fireirons, fenders, grates, lamps, or the fine lecterns to be seen in the north room, or whether it be in the form of jewellery and table silver such as are to be seen in the case of silverwork in the central hall designed by Mr. C. R. Ashbee, and executed by A. Miller, W. Mark, G. Horwood, G. Hart, and J. Baily of the Guild of Handicraft, or in the case of jewellery designed by Mr. Alexander Fisher and executed by him and his assistants, which is also in the central hall. Of quite a different type, but equally excellent, are the small plaques by Mr. Frank Lutiger or Luttiger, for the name is differently spelt on separate pages of the cataogue, of H.M.S. *Lord Nelson* and H.M.S. *Glory*, which are interesting, not only in themselves, but as showing that a modern battleship is capable of forming the subject of a real work of art.

The lecterns in the north room, to which we have alluded, are an eagle lectern in brass, designed by Mr. W. Bainbridge Reynolds and executed by A. Dufour, D. Brooker, and F. Porter, and a wrought-iron ectern designed by Mr. Edward Spencer and executed by Walter Spencer and B. Edwards, with some apital book-rests in leather by Florence George. Each of these displays originality of treatment and excellent design suitable to the material without extravaance or eccentricity. They would not both be in harmony with any and every church, but given the right environment would put to shame ninety-nine out of a hundred of the things that do duty for lecterns.

A pair of church candlesticks in wrought iron, also designed by Mr. Edward Spencer and executed by the same craftsmen as the lectern are to be noted mongst the excellent things in metalwork to be found in the north room.

Woodwork has always been a strong point amongst the work shown by the Arts and Crafts Exhibition Society, and in the portico we are at once struck by the settle with carved panels designed by M. Grace Mead. The music cabinet designed by Mr. George Jack and executed by himself and Laurence Turner is, spite of its general merit, one of those examples to which we have referred as showing an exaggerated affectation of poor technique, in this instance in the carved frieze. Another curiosity of affectation is the ebony and walnut cabinet executed by Henry Daroll from the design of Mr. Ernest Gimson, who is as usually well represented. In this case the top and ends are treated in matched veneer in such a way as to suggest that the piece of furniture is made out of a single log, which apparently has been dug out to allow of the planting in of a chequer work of dark and light drawers. Mr. Gimson's chest of drawers in English oak, executed by F. Orton, has an almost extreme simplicity, to which contributes the single cut-wood handle of each drawer, a device to which we do not object, as they are eminently comfortable and the drawers run well.

A magnificent piece of work is the wardrobe of satinwood and sycamore, with inlaid ornamentation and silver mounts, designed by Mr. E. J. Minihane and executed by E. R. Gribble, with silverwork by H. Davis. This is priced at 126*l*., a sum that not everyone can afford for a wardrobe. The bookcase designed by Mr. F. C. Neilson and executed by Petersen is not in accord with the best traditions of the Society, the badly designed quasi-architectural detail of the cornice being quite unsuitable even if it be not a deliberate piece of affectation. Mr. Ambrose Heal's inlaid oak wardrobe is a good piece of design; and Mr. W. A. S. Benson's inlaid rosewood cabinet with metal mountings is quite a striking affair, even if rather overdone with metal.

The mantelpiece, grate, and accessories designed by Mr. H. Longden are repellent from the coarseness of the detail of the mantel, which, whilst reminiscent in general lines of the chimney-pieces of the Adam period is entirely destitute of the refinement that we expect to accompany any work based on that period. Another piece of furniture that jars upon us is the carved and painted bedstead designed by Alberta Plymouth, and executed by Henry Tremlett and Alfred Westover, which seems to us to have entailed a lamentable waste of time and labour in carving as a ground for a hideous colour scheme. Surely the design of a bedstead should suggest rest and not nightmare. Mr. Ambrose Heal's painted four-post bedstead close by tells quite a different story, and for a cheap piece of artistic furniture is commendable; albeit, the method of decoration is not of the most permanent. It would, however, probably last long enough to allow of a change of taste in its owner and a desire for a revision of the decoration.

The most striking object in the west room is Mr. JOHN D. BATTEN's triptych for St. Martin's Church, Kensal Rise, painted *in tempera*, the carving and gilding of the framework being executed by MARY BATTEN and assistants, whilst the hinges were damascened by HAROLD STABLER. This and the studies for the various figures occupy a great part of the space of the longest wall. Of the remaining exhibits in this room, the majority are designs for either stained glass or wall decoration of pictorial character, not always quite legitimate in treatment, as in Mr. HENRY A. PAYNE's cartoons for window in St. Martin's Church, Kensal Rise. In this room also are some more examples of excellent jewellery.

In the south room Mr. HEYWOOD SUMNER's cartoons for sgraffito in his well-known method of varied coloured grounds stand out prominently, the examples being a piece of decoration for St. John's Church, Miles Platting, Manchester, and another for a garden house at Doveleys, Staffordshire. Near by, and very interesting, are Mr. HERBERT A. BONE's pictorial stencils, but one hardly sees the object of such work, except as a curiosity, for the reason of stencilling is to provide a ready means of repeating a decorative design, and a picture loses its value if it is to be repeated at a cost closely approaching that of a single painting.

Architecture is hidden away in the gallery, and consists only of a few photographs and rather indifferent drawings of the picturesquely simple type of architecture that is suitable enough for the week-end cottage or the garden city, but does not extend beyond this.

## NOTES AND COMMENTS.

WE are gratified in having received twenty-one drawings in our newly-started Students' Sketching and Measuring Club, and shall next week give a criticism on these and announce the name of the author of the design we consider the best. Our subject for February is a measured drawing, or drawings, full particulars of which will be found in our advertisement columns. We should be glad if those of our students who have adopted a *nom de plume* would keep to the same throughout.

ONE great difficulty that often occurs in the building trade is the desire of various unions to obtain for their members an exclusive right to work to which architects and contractors think they are not strictly entitled. Thus there has been trouble in the past because bricklayers thought they only ought to be allowed to lay tiles on roofs. We know of architects who have avoided the use of tiling rather than have it done by bricklayers, who seem unable to get on without mortar, a substance that is not desirable for more than the miminum extent in the construction of a tiled roof.

AT Leicester there has recently been a dispute between the plumbers and the heating and domestic engineers as to who was entitled to the right of doing hot-water work. The matter was referred to arbitration under the Conciliation Act 1896, and the arbitrator, Mr. JOHN SMITH, has given his award, which is published in the January number of the journal of the National Association of Master Heating and Domestic Engineers, with an abstract of the evidence on both sides. The gist of the arbitrator's award is that plumbers are to do all leadwork and all domestic waste, soil or ventilating pipes above ground, but that other work may be done either by plumbers or by hot-water, heating and ventilating engineers.

THE recent development of interest in Town Planning in England lends additional force to the attractiveness of the ninth International Housing Congress which is to be held at Vienna from May 30 to June 2 of this year, and the National Housing and Town Planning Council is organising arrangements for a party of British delegates to attend the Congress and to extend the journey to enable Berlin and probably Dresden to be visited.

ALL lovers of Rome's antiquities will regret to hear that Commendatore BONI has resigned his membership of the Commission for the Zona Monumentale. The members of the Commission for the most part are simply intent on converting a portion of the Via San Sebastian into a boulevard. Commendatore BONI wishes to maintain and restore its archæological interest.

BLACKFRIARS BRIDGE will shortly be altered in order to improve the appearance of the structure, which by some people is considered unsightly. When the bridge was widened recently it was found impossible to rebuild at either end of the west side the two large masonry pedestals which added to the appearance of the bridge from up the river, and in their place a refuge containing seats was constructed on the south side, and at the corner of the Embankment a wide curve and staircase were made. The two remaining pedestals on the old portion of the bridge now give the structure an unbalanced appearance from the street, and do not have a beautifying effect from the river, as they are hidden by the S.E. & C. Railway bridge. It has, therefore, been decided to remove the pedestal on the southern side, and a refuge similar to that on the opposite side of the road will be constructed in its place. The work will be commenced early in February. It is probable that the then solitary pillar on the northern side at the corner of Queen Victoria Street will be modified slightly.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

### III.—ICE CHAMBERS—(*continued*).

IN chambers cooled by ice alone, the blocks are supported in an open crate, which allows free circulation of air all round the ice. This ensures efficient cooling, and, at the same time, lessens the danger of moisture being deposited on the goods in storage, owing to the fact that the air, as it flows towards the ice, becomes, for the time being, very cold. Its "hygrometric state" (explained below) is thus momentarily brought below saturation point, and the surplus moisture carried by it deposited on the nearest and coldest object—the ice—instead of as sometimes happens through bad design, on the walls of the chamber or the produce stored.

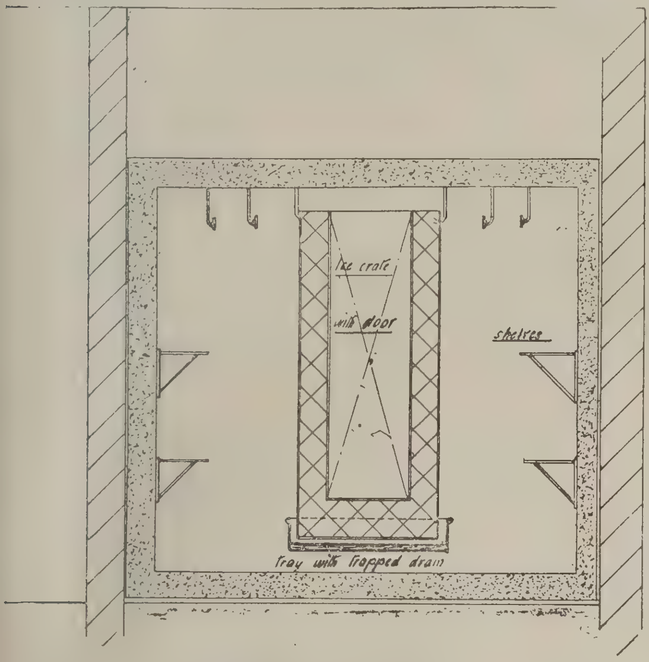
At one time the crate was made of wood, but owing to the rot set up by the wet ice, this construction has been abandoned, and modern practice is to carry the blocks in an oblong basket of galvanised lattice work. This should be supported on galvanised slings of suitable strength, and underneath a zinc tray should be provided to catch the drips caused by the melting ice. As the tray necessarily becomes very cold, moisture is apt to condense on the under side of it, and fall thence on to the floor, or on to any shelves which may be below. To prevent this, it should be well insulated, and the ice water drained from the top as quickly as it is formed. This is accomplished by means of an ample-sized pipe, which is soldered water-tight to the tray, and carried through one of the walls to the outside of the chamber. In order to form a water seal and keep the warm air outside from penetrating, when no water is flowing, a horseshoe bend is made, and the mouth of the pipe should be covered with a strainer to retain all solid matter, such as sawdust, dirt, &c., which might otherwise block the outlet.

An ice chamber constructed on these lines, which was built for a London hotel, is shown in fig. 6. The arrangement of the drain is seen, and it will be noticed that shelves are fixed to the walls to hold the small stuff, which is commonly stored in these places.

The essential differences between the two types of ice chambers outlined above are those just described. In other respects they are very similar, and it will not therefore be necessary to differentiate in describing the methods of construction which are usually followed.

Before proceeding to this, however, the merits and demerits of the two systems will be briefly considered. The use of each is quite clearly defined, and it is only in special cases that they overlap. It may be said that the division is a question of temperature. Below freezing point, ice and salt is indisputably superior, but for ordinary storage it is equally certain that block ice is more economical, and, at the same time, keeps the goods in better condition. The reason for this is that the danger of moisture deposit becomes, at ordinary storage temperature, more serious with ice and salt than it does with ice alone. Hence, under these conditions the latter system is much to be preferred. On the other hand temperatures below 32° Fahr. cannot be attained by the use of ice alone, and as in these circumstances, just where it is most useful, the ice and salt system has, owing to the freezing of the moisture, no ill effects, it is then universally employed.

Moisture condensation is a very important factor, which has to be reckoned with in the design of ice chambers. It is caused by the fact that a given quantity of air cannot hold in suspension more than a certain definite percentage of water vapour. If it is charged with the full amount it is then said to be saturated, and under no circumstances can more than this amount be carried. The difficulty, as far as ice cooling is concerned, is that the percentage necessary to bring about saturation varies with the temperature. As this becomes lower, less and less water can be carried by the air. The result is that air, whose hygrometric state at normal temperature is below saturation point will, if cooled sufficiently, find that it is required to carry more moisture than it is able to do, and will promptly discharge the surplus. Taking as an example air at 70° Fahr., with a hygrometric state of 80 per cent. (*i.e.*, carrying 80 per cent. of the maximum charge for that particular temperature), it is found that, on being cooled to 61° Fahr., it will become supersaturated as much as 10 per cent. Hence, as no more moisture than just enough to cause saturation can be held in suspension, the extra 10 per cent. is at once condensed, and, if the condensing surfaces are formed by the goods in an ice chamber, trouble begins.



SECTIONAL ELEVATION.

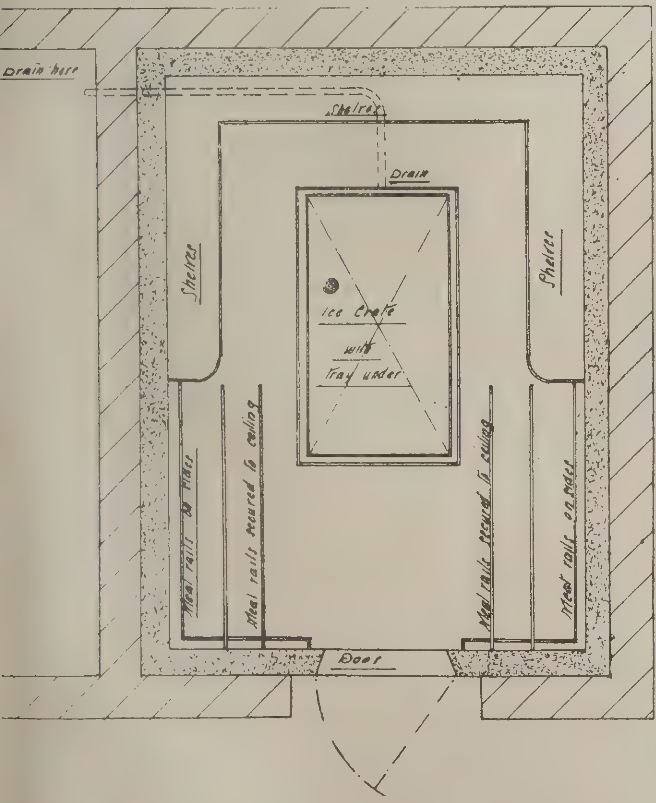


FIG. 6.—PLAN.

It is clear, then, that the greater the reduction in temperature, the larger the condensation. Now the air, circulating by convection currents in an ice room, varies in temperature throughout its circuit, the direction of which is shown by the arrows in fig. 7. When it leaves the provisions stored, it is comparatively warm, but as it flows towards the cooling apparatus, supplanting the air already cooled which is falling downwards, it becomes suddenly chilled. The result, as explained above, is a condensation of moisture, the amount condensed being larger the bigger the temperature drop. Hence, if it is sought to maintain an ordinary storage temperature with ice and salt, there is more condensation than there is with ice alone, as the mixture is far colder than the plain blocks and, consequently, the temperature drop is greater when the air approaches the cooling tank. Further, whereas with ice and salt condensation may be effected on any convenient surface, with ice blocks in an open crate, the air, having perfectly free access, simply deposits its moisture on the ice itself.

It will be seen, then, that owing to the greater tendency to create dampness, the ice and salt system should not be used for ordinary storage temperatures. But, on the other hand, below freezing point it works perfectly. Less moisture is formed owing to the smaller temperature drop, and what is formed is frozen at once. Further, the temperature required can be attained with ease, owing to the low melting point of the salt solution.

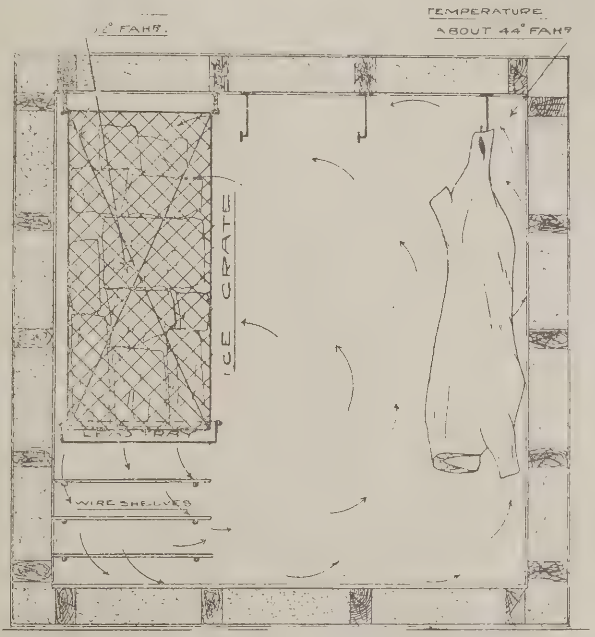


FIG 7.—ELEVATION.

Certain purely mechanical points are also to be taken into account. For instance, an advantage possessed by the crate and block ice is, that the opening in the crate and the corresponding ice door in the insulation may be arranged in any of the sides or at the top, just as desired. With the ice and salt tank, on the contrary, it can necessarily be only at the top. Where head room is scanty this is inconvenient, as sufficient space must always be allowed between the top of the chamber and the ceiling of the room to get the ice in, and this loses one, in some cases as much as two feet of height inside the chamber. Also, a ladder must be used to reach the top, and the ice and salt must be laboriously carried up by this means. These defects are inevitably present with the ordinary chamber, but they may of course be nullified by using a room in the basement, and cutting a trap above the cooling tank, to admit the broken ice and salt. With larger chambers a further disadvantage of the system is the breaking up of the ice in order to mix it with the salt. When a large quantity has to be negotiated, this operation is apt to become very troublesome.

Both systems, therefore, have their disadvantages, but notwithstanding, if used in the proper way, and for the right purpose, each may attain to considerable efficiency. Many chambers, however, whose designs are in other ways perfect, are completely spoilt by deficient insulation, and great care must be taken to avoid this, by selecting only the best materials, and using those chosen to the best advantage. This is especially important with ice and salt, as, should the temperature rise above freezing point the main reason for the efficiency of the system is at once destroyed.

One of the best materials that can be used for this purpose is silicate cotton, as, owing to its high efficiency, a comparatively small thickness may be employed, and a saving effected, both in space and cost. Also, although it has a certain amount of capillary attraction, it is not spongy, and does not absorb and retain moisture to any great extent. Granulated cork and charcoal share most of these properties, but are a shade less efficient as far as heat resistance is concerned. Otherwise they may be regarded as on a par with silicate, although charcoal, of course, burns readily in case of fire. Peat moss litter should not be used alone on account of its low resistance, but a good combination is obtained by mixing it with cork. This reduces the cost, and, although the efficiency is a trifle less, a compensating advantage is gained in the preservative effect exerted by the peat. Sawdust is also employed for ice chambers, but, owing to its low resistance to heat, its great attraction for moisture and its liability to decay, it should be as far as possible avoided, and specified only where cheapness is a *sine qua non*. If, for this reason, it has been adopted, then the walls should be made of greater thickness than is common with other materials, and the zinc lining inside should on no account be omitted.

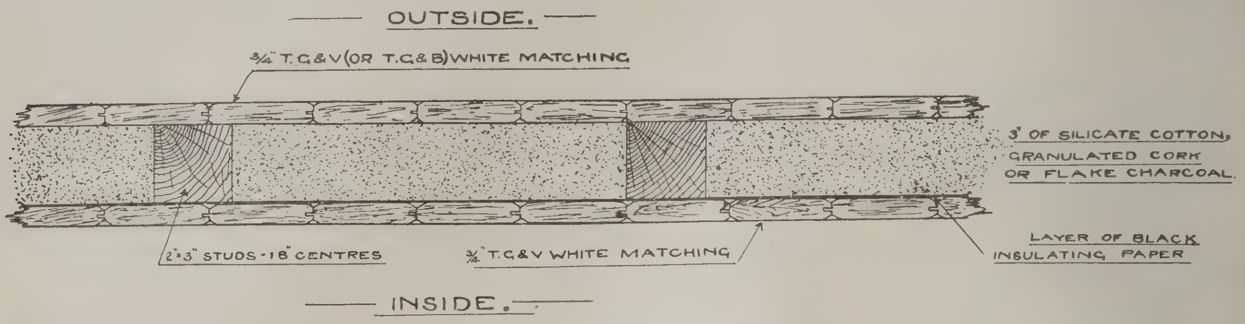

OUTSIDE.
¾" T.G.&V (OR T.G.&B) WHITE MATCHING
3" OF SILICATE COTTON, GRANULATED CORK OR FLAKE CHARCOAL.
2"×3" STUDS - 18" CENTRES
¾" T.G.&V WHITE MATCHING
LAYER OF BLACK INSULATING PAPER
INSIDE.

Fig. 8.

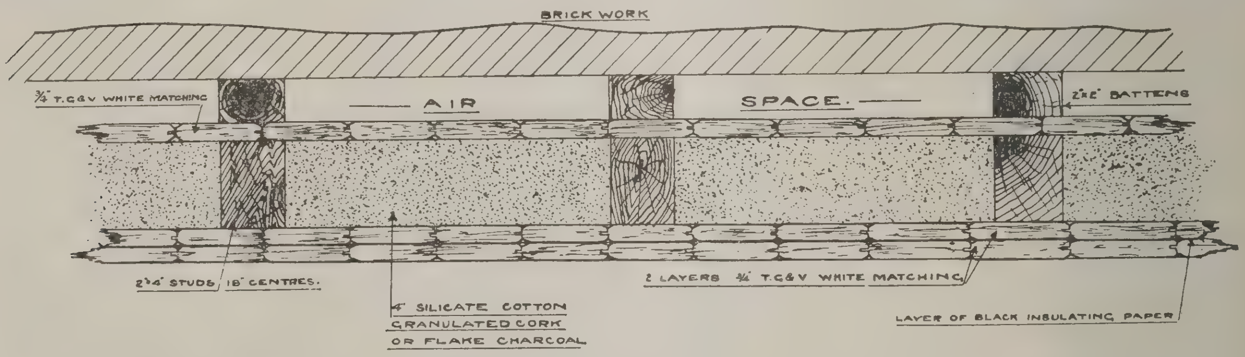

BRICK WORK
¾" T.G.&V WHITE MATCHING
AIR SPACE.
2"×2" BATTENS
2"×4" STUDS, 18" CENTRES.
4" SILICATE COTTON GRANULATED CORK OR FLAKE CHARCOAL
2 LAYERS ¾" T.G.&V WHITE MATCHING
LAYER OF BLACK INSULATING PAPER

Fig. 9.

The exact method of constructing the insulation varies considerably in different cases, and is influenced by considerations of first cost. If a chamber where ice consumption will be reduced to the absolute minimum is desired, the walls must then be made very thick and the first cost will thus be at its maximum. Similarly a minimum of initial cost, with thin insulation, corresponds to a maximum of ice wastage, although at the same time it effects an economy in space. In practice the inclinations of the purchaser must be consulted, but in all cases it is undoubtedly to his advantage to invest more capital in the first instance, and in this way save ultimately in his running costs.

Any figures, therefore, that are given for the thickness of insulation in different cases are merely arbitrary, and those recommended here must be accepted as striking an average balance between prime cost, on the one hand, and running expenditure on the other.

Working on this basis, it may be said that with the ordinary storage temperature of 42° Fahr., and up to about 200 feet cube of inside capacity, a thickness of 3 inches should be employed when using silicate cotton, granulated cork, or flake charcoal. The insulating material should be packed between 3 inch by 2 inch runners spaced 18 inches apart, as in fig. 8, and should be sheeted on either side with one layer of ¾ inch T. G. and V. white matching, a layer of waterproof insulating paper being interposed between the inner layer and the insulation. The floor would be similarly insulated, except that 1 inch T. and G. white flooring would be employed instead of the inner layer of ¾ inch matching, and insulating paper, as before, would be placed between the floor and the packing. The chamber should be built in six sections, and put together in its final position, thus allowing of easy removal at any time to another situation.

At larger storage capacities it is generally found that an ordinary room or cellar is used to form the cold store, and in this case the walls are lined with insulation as they stand, the work being carried out on the spot instead of, as in the former case, mostly in the makers' workshops. It is common practice in these larger sizes to increase the thickness of the insulation to about 4 inches, and instead of a single layer of ¾-inch matching on the inside, a double sheeting may be used, with waterproof paper between. A 2-inch air-space should be left between the outer layer and the walls to promote free circulation of air all round and prevent dampness attacking the insulation. This can readily be effected as shown in fig. 9, by using 2 inch by 2 inch battens as distance pieces.

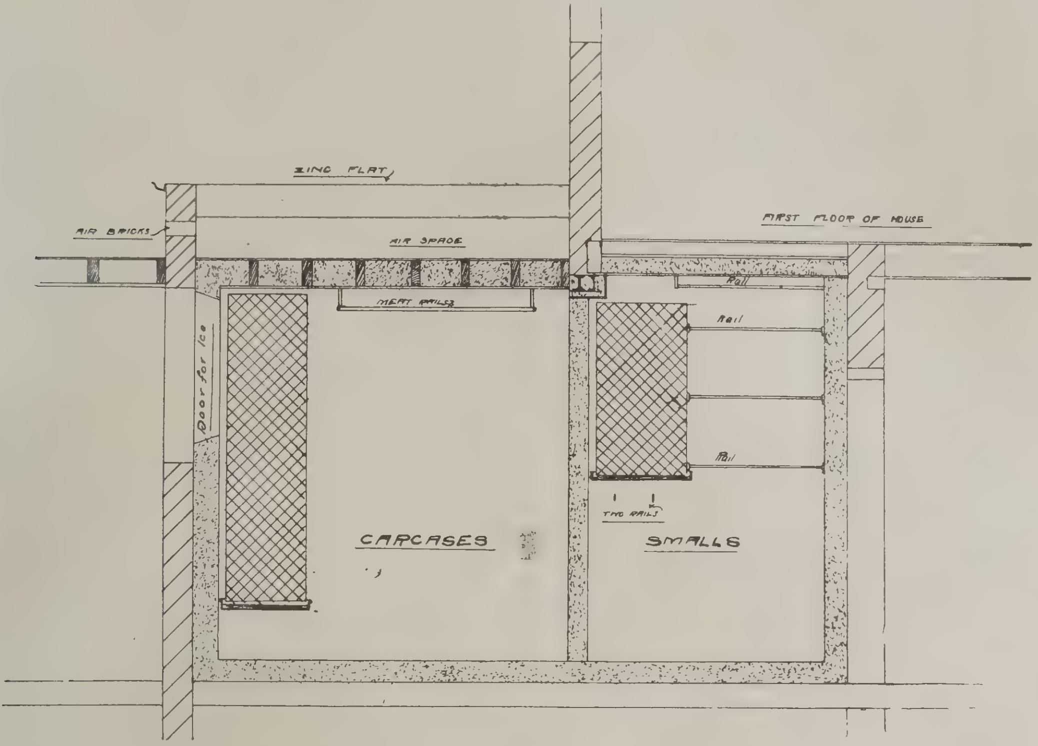
Theoretically this increase of thickness of insulation at larger capacities is incorrect, as the proportion of the radiating surface to the volume of the chamber is then considerably greater. Practically, however, it is admissible, as in small chambers economy of space and first cost are both important factors, and can be attained only by reducing the thickness of the walls to a minimum. Further, the total consumption of ice in these chambers does not amount to very much, and economy in this respect is not so essential as it is in the larger sizes. It is on this principle that in very small boxes where the insulation should theoretically be thickest, 2 inches of insulating material is usually considered sufficient.

The figures just given apply only to silicate cotton, granulated cork, and flake charcoal. If sawdust is used the thickness must obviously be increased in direct proportion to the heat leakage permitted. That is to say, that the thickness of sawdust must be to the thickness of silicate cotton as .10 is to 0.06, or in the ratio of 5 to 3. This holds good in all cases.

When low temperatures are maintained for longer storage periods yet another increase takes place. Here the difference between the temperature of storage and that of the atmosphere is usually about 50 per cent. greater than under ordinary conditions, and the tendency to heat leakage is, by Newton's law, in the same ratio; consequently, in order to maintain the same efficiency, the thickness of insulating material must be increased in proportion. Hence, at these temperatures, the figures given for ordinary storage are to e multiplied by 1.5; if sawdust is employed by 1.5, and gain by 1.66; that is by 2.5 altogether.

Whatever form the insulation takes, the inside of the hamber should invariably be lined with zinc. By this means ny moisture which may condense on the walls can be readily riped off with a cloth, whereas if the lining is omitted it oaks into the wood, and not only damages the insulation, ut affords a favourable breeding ground for germs.

Two doors are necessary in an ice chamber, one for ice dmission, and the other for entrance. They must be inulated in the same way as the walls, and made either played or rabbetted. In both cases efficient lever fasteners hould be fitted, and a joint made either with felt or rubberubbing to ensure the door being air-tight when closed. The ain door should be about 5 feet 6 inches by 2 feet 2 inches n the clear, but the size of the ice door is naturally fixed y that of the ice-crate or tank, the capacity of which aries from an eighth to a sixth of the volume of the chamber.



ELEVATION.

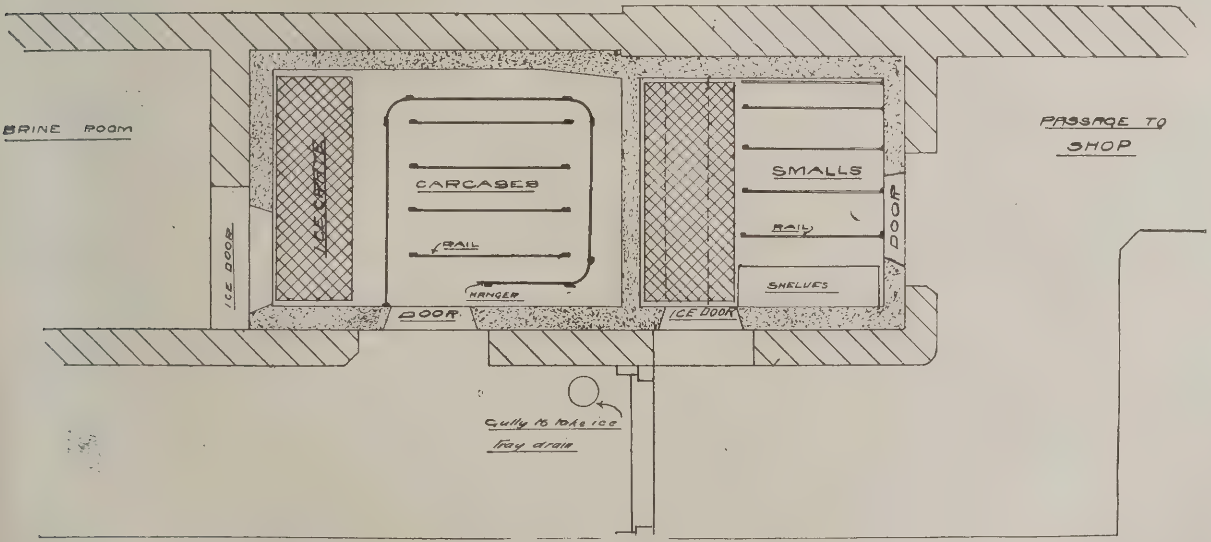


FIG. 10.—PLAN.

The fittings which are to be specified depend on the urpose for which the chamber is to be used. For storing neat in quarters, joints, &c., galvanised bars should be laced near the ceiling, supported by galvanised hangers and vall sockets. If small articles, such as game or provisions, re being preserved, then shelves, either of galvanised-wire attice work, or of wood, are more useful. One or two of hese may also be used with advantage in conjunction with he bars, and, in any case, where bars are employed for hanging larger pieces of meat, rails should be fixed all round the walls for the small stuff.

A convenient arrangement of bar work is shown in fig. 10, which represents two cold stores built for a butcher with a large business, and in the hotel chamber, illustrated in fig. 6, the shelves used to carry provisions and small goods have already been pointed out.

The floor of the ice chamber and the bottom of the ice crate should always be covered with wooden mats to prevent damage, and in dairy work lengths of half-round iron should be screwed, at about 3 inches pitch, to the top of the floor mat. This is in order that the churns of milk stored may be slid easily in and out of the chamber. Also, the door sill, to obviate injury to the woodwork, should be covered with chequered plate, such as is used for engine-room floors.

Another point which must always be accorded due attention in the design of the chamber is ventilation. This is preferably carried out automatically by sensitive ventilators in the roof, using light mica flaps, very delicately hinged. By this means the hot air charged with impurities and moisture, which arises from meat newly put into the chamber, is at once expelled, and only the fresh cold air allowed to remain.

This point, with the others already mentioned, should be made clear in making out specifications.

(*To be continued.*)

## THE ART OF BUILDING.*

WHENEVER one sees an artist sketching in some old world village, one realises afresh how modern art is divorced from the realities of life. No artist in the old days ever contented himself with producing merely shadows of reality. He was busy creating the very stuff of the world, weaving a garment of the gods to adorn the earth. His canvas was flung wide over the country side, and all his pictures were painted in the real. When he had done his work in the valley, the valley was a more beautiful valley than before. He adorned the hills with castles, and set the plains with many a jewel—in moated grange, manor, and farmhouse. In the walled town, too, he was still a creator of beauty in the real. The mother art was the essential thing—nothing was or ever could be so important.

Let us now briefly consider then the materials we may use in building: and first let us take stone.

We have in many districts stone of various kinds for building; and in most of these districts we have object lessons in old buildings, showing how stone may be beautifully used. It is unfortunate, however, that the modern mason seems quite unable to profit by such examples: he always wants to improve on them. The art of masonry may often be made a kind of rude mosaic, in which stones of various shapes and sizes and tints can be combined and arranged. In old cottages in Surrey you may find the irregular spaces between the stones adorned with scraps of flint, iron stone, and broken red pottery, with excellent effect. Another instance of the same mosaic in masonry may be found in the old castle at Peel, in the Isle of Man, where the wide scale of tints in the local stone from various shades of red to grey and yellow is taken full advantage of. Is it necessary to add that in the local modern buildings of the same stone, the material has been reduced to an absolute regularity of tint and surface? When the modern mason does descend to rough walling he lets us know it, and can only give us an exaggerated excrescence in the centre of each stone—a confection known as rock-faced. And he seldom knows how to deal with the mortar joint, which in good old work makes such a beautiful reticulated pattern of varying shades of grey.

If only, instead of ignoring the qualities of materials and forcing them into these meaningless forms, we were to begin at the other end, what a new world of art would be disclosed to us. A visit to the site of our building may disclose, perhaps, the fact that flints are the essential local materials for walling. What a palette is there for the artist, of tones of pearly grey; what a variety of textures can be obtained, too. Here the soft rounded outlines of the uncut stones, and here, to mark some special feature, the cut flints. The surfaces of the walling enriched, perhaps, with the shivers of the broken flints set in the joints, or notes of red brick or brown stone. And all this you won't find anything about in books, or learn anything about in offices, or art schools. It is a kind of rude natural mosaic, and if rightly done implies the use of materials in the right way, inasmuch as it develops to the utmost their possibilities, instead of obliterating their character by forcing them into preconceived academic formulas. It seems that we are too apt to put the cart before the horse in these matters, and instead of letting the materials influence us and suggest the design, we let them have no voice in the matter at all, but simply shape them into the arbitrary forms we have learnt at school.

Passing on to consider bricks and brickwork, I suppose every architect has in his office one of those perfect bricks that is the manufacturer's pride and joy, absolutely regular in form and uniform in tint, and which is just everything that a brick should not be—from the point of view of the artist in building. A brick is after all a piece of baked clay, and its beauty consists in its character. It should have the characteristic surface and texture of mother earth. It should be of the earth earthy. In this connection, I remember a great collector of Japanese pottery once showing me a little rude earthen pot. It had no elegance of shape, and would have been scorned by the average buyer of vases. And yet in Japan it was held a perfect thing; and its chief claim to beauty rested in the fact that its form implied the expression of the character of its material. The object of the artist in making it had been to express its inherent clayeyness: subordinating all his own personal aspirations about form, he had sympathetically divined the character of his material. And a nation of artists understood his aims, and appreciated his efforts. And so our bricks must first of all express the true inwardness of the stuff they are made of.

Then as to their colour, a tint which is subtly varied must necessarily be more beautiful than a uniform shade, and more in harmony with natural surroundings. The mortar joint should not be a succession of mechanically ruled lines, and should be neither too light nor too dark in tone, but introduce into the colour scheme a tone of neutral grey, which is always so useful in the general effect of the work—helping to give it that kind of bloom, that indescribable quality of tone, which we find in old brickwork, such as that at Cambridge, for instance.

Then in the matter of roofing materials: the most important quality here is texture, and so tiles should be thick, and if their new colour, as is generally the case, is too even in tint to be good, they must have such a texture as will weather and vegetate quickly. It is most important also that the tiles should have those slight irregularities of form and surface which give such interest and charm to old roofs. Nothing is so fatal to the beauty of a roof as tiles which are absolutely regular—giving the effect of a surface ruled with absolutely rigid horizontal lines. You might just as well cover your building with galvanised iron at once. There are at present perhaps no entirely satisfactory tiles made from the point of view of the building artist. The best of them will strike a jarring note of red in the country, and the darker ones are too even in tone to be good. If it is impossible to get old tiles, one is bound to accept a tile which is very crude in its effect for the first few years. Perhaps some day tile makers will weather and mature our tiles for us.

Probably you will agree with me that the finest kind of roof is one of stone—such as the Colley Weston. It is one of the few materials for roofs which is beautiful when new and grows in grace with age.

Slates have the defect that they do not readily yield to nature's inimitable colouring. The rougher and thicker they are, the better the artist in building will like them; and except in their own special locality he will perhaps prefer a good grey tone to the more fashionable green. There is a kind of harshness about slates which makes them specially at home in bleak and barren uplands, or in wind-swept open spaces by the sea; while the kindly warmth of tiles makes them more adapted in wooded and sheltered places.

It is unfortunate that thatch is not more widely used for small buildings. If it is treated with some preparation to make it fireproof, the main objection to it is removed. It affords far the best protection against outside conditions either of heat or cold, and so is well adapted for small buildings where the bedrooms are in the roof.

In the use of timber for building many opportunities and possibilities are lost in the initial preparation of the material, as well as in its subsequent treatment in the workshop. In dealing with materials generally, and perhaps timber in particular, there are two main ideals which may be followed. In the case of timber which has no great hidden beauties to bring to light by high finish, it is wise to aim at securing some suggestion of those natural graces which belong to its living existence as a tree. In the case of other special timbers we may give up this natural beauty for those qualities which can only be educed by a high degree of finish. The great thing to avoid is to halt between these two ideals, and so spoil our horn without achieving a spoon.

I cannot help but note here how strangely these general principles apply to all departments of life. You may remember how this was illustrated in one of those charming early novels by Bernard Shaw, where the hero, merely from being a master of the art of prize-fighting, gained in a degree an insight into the principles which should govern all arts. That is perhaps an extreme case. But the point I specially want to note here is, that in writing an essay on the treatment of materials and in showing how they may be educated, I find the same remarks apply exactly to the whole question of education; and the same defects occur in educating human beings as in educating planks of wood. In both cases we so often spoil our horns without making spoons, and so often try to make silk purses out of sow's ears. But while the human problem is an immensely difficult one, involving a sympathetic insight into the nature of the pupil and his possibilities, in the education of materials in the workshop it is relatively simple; and by the use of hand tools, at any rate for finishing the work, we cannot go very far wrong.

It is better in most cases to finish such timber as oak with the adze instead of the plane. Let me add a few words as to the higher education of such materials as mahogany, rosewood, and the like.

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* A lecture by Mr. M. H. Baillie Scott, delivered on January 19 at Carpenters' Hall, London, E.C

Even here I don't want an absolute level surface or straightness of line; but just such subtle undulations as a sculptor might make in highly finished marble. The surface must just so far be alive as that. And then not glassy French polish with its disconcerting stare that is like that excess in glossiness and shininess in boots and hat which we associate with a certain type of City gentleman. Instead of that, let us have the quiet, unobtrusive sheen which a wax polish gives.

In the development of design from the suggestions of the material, a very good instance is that kind of inlay work which consists of a landscape in which the markings of the timber, which so often suggest landscapes, are taken as the basis of a design. Another example is in the use of cross sections of laburnum wood. This material, as you are probably aware, has the annular rings extremely well marked, and these cross sections were often used in old work in hexagons, or in what I think is called the oyster-shell pattern, with very fine effect. The grain of wood, as well as its natural colour, will give the best basis of design for inlay; and unless the designer is in close touch with his material here as elsewhere, he will lose all his opportunities. In this mosaic of wood, which we call inlay, I believe that the best results may be gained by slight varieties of plane in the surface.

In wood carving what suggestions has the material to offer? We must respect its limitations and possibilities, and our wood carving must be primarily just another means of educing the woodenness of the wood. That is the main characteristic which strikes us in old work. The woodwork is essentially wooden: there is a kind of blunt knobbiness about it. The material has been educated, and its hidden characteristics brought to the surface. When the Renaissance came that ideal was lost, and the material was used merely as an unregarded medium for expressing the conceptions of the designer.

Let us take the case of that famous carver Grinling Gibbons, and let us begin by paying a proper tribute to that almost miraculous skill which places his work almost beyond criticism. He is such a master of his tools that we find he has fallen into the too common fault of ignoring and overriding all the true inwardness of his timber. He is not interested in it at all, but only in his own designs, and merely wants a nice obedient and accommodating material, and so he carves in soft wood. He will then give us a lobster, perhaps, or a bunch of pheasants, rendered with marvellous imitative exactitude. We may wonder, as we do wonder, at these Renaissance triumphs, just as we wonder at fireworks. But art should move us to something more than that. If we want to look at lobsters we can see them in any fishmonger's shop. This imitative rivalry with Nature is the stupidest kind of ideal. And so the work of Grinling Gibbons, wonderful as it is, seldom becomes more than a kind of curiosity of art—a triumph of mechanical skill.

It is a difficult matter for the building artist to find a modern glazed tile which he can use. The manufacturers have all aimed at a mechanical regularity of shape, uniformity of pattern and staring glassiness of glaze, which make practically all modern tiles impossible. There are, of course, or rather there were, the de Morgan tiles, which, excellent in colour and design, were still somewhat glassy in their effect; and certain modern makers have produced dull tiles which err on the other side, and have a dead lack lustre aspect. Where then is the perfect glazed tile to be found? Probably only nowadays in the old Dutch tiles. In these the glaze has a thick and creamy quality of subtly varied tones, and in form, texture, and patterning they are full of individual character. It is the same story over again, and beauty has been achieved by sympathetic treatment of material and expression of its qualities. The drawings on these tiles would probably be a matter of scorn to any modern draughtsman, and yet they are perfect in their way, because they speak eloquently of material and process of manufacture. Is it too much to hope that some of our modern makers can learn this simple art, and give us tiles which do not fix us with a glassy stare? In the meantime, the building artist must do without tiles altogether, or use the old Dutch tiles.

No one has done more than Mr. Bankart to revive the possibilities of the use of plasterwork, and in his work you cannot find a better example of design in close association with workmanship—design which evolves and emphasises the qualities of the material. There are two points in regard to plasterwork which I should like to bring before you. One is texture. Mechanical ideals in this, as in other materials, have led to absolutely smooth rigidity of finish, which obliterates all the character of the material, and those suggestions of methods of workmanship which lend such interest to the work. Do not then necessarily finish your plaster with fine stuff, but preserve the texture which the sand gives, and finish from the float with subtile variations in plane. In the arrises, such as those which occur at the sides of a dormer window, do not work to a rigid line such as is given by a cement or wooden bead, but let the line of the arris take the characteristic line which results from deviations in plane of the surface of the plaster, and let this slight waviness of line occur in your plaster cornices as vague and soft in its outlines as waves of the sea. Let the finished plaster still retain some hint that it was soft and yielding when used; let it flow round the woodwork perhaps engulphing it partially, as if it had risen like a flood which had been frozen. You will find many examples of these qualities of plaster in old work, and but few in modern times. Then as to colour, the natural tint given by the sand will often be found to be a good one, and in such cases the plaster may be left untinted. If, however, the plastering is tinted, let it be for choice some tint which is germane to the material—an earthy colour, such as ochre, and not Nile green, peacock blue, or any of those shades dear to the art decorator.

The use of glass in building is generally wisely confined to the windows. Here, again, we building artists want it to be made and used in the old way—in comparatively small planes, with those slight variations of surface which give our windows a friendly twinkle, instead of a glassy stare. Glass is a material to be used with caution in a building. The less we have of it the better, unless its surface is very much broken up, as in glass mosaic, for instance. Glass tiles are harsh and glaring in their effect. Glass shades so much in vogue in the Victorian era have now been happily banished to the garden.

In considering the metals used in building, I have to weary you with the same demand for the evolution of character. In wrought iron, for instance, the particular form you may fancy for the hinges or latches of your doors gains its chief value as design, according to the extent to which it expresses the qualities of the material. In wrought iron we have a substance which, rigid when cold, becomes in the heat of the fire a soft and ductile thing, and the expression of that gentler mood of the iron is the most charming thing we can express about it. It can be shown by outlines which seem to be the resultant of surface pressure—by the swelling of the soft metal round the stamp of the die, as in old coins and in many other ways. In simple ironwork the filing of the cold iron may be combined with the hammering of the hot metal. In finishing such work do not obliterate all the varied tints of the surface with black paint, but finish with linseed oil instead, so that you retain the brighter notes of the file work with the grey tones of the forged iron. In cast-iron work we have plenty of fine examples in the old fire-backs that used to be made in Sussex, and many more examples in modern work of inferior work which has made the very name of cast-iron a reproach. The same suggestion and somewhat vague modelling that expresses the qualities of plaster is equally right here, and these qualities in the mould will save the work from that forbidding precision and rigidity which we associate with the term cast-iron.

In this brief review of materials, considered from the standpoint of the building artist, a word may be said as to that extremely revolutionary and radical material, ferro-concrete. There is something necessarily illogical in the use of this in connection with those architectural forms which have been evolved as vital and essentially structural features in the buildings of the past. If we are going to use ferro-concrete let us be logical about it, and recognising its revolutionary character, let us have here, if nowhere else, a new style. Let the adornment of the structure within and without be admittedly superficial in character, with no sham features about it.

In Venice the greatest painters of the time used to adorn the external walls of their buildings with paintings. That would hardly serve in London to-day; but nothing could be better than mosaic and tiles, and such like washable materials used in decorative ways. And in the country this surface mosaic may take a local flavour, which, by the use of pebbles in the form of rough-cast or flints, as already referred to, may bring the building into harmony with nature. If we consider our function as adorners of the earth's crust, we must make our adornments out of the same materials as that crust—just as a pastrycook adorns his pies with pie-crust. Stone, brick and timber are all sound materials to expose to view in the building, but not iron.

Now I daresay there are some of you here who may think that all this talk about art in connection with building, is not very practical. But what does art mean to the worker?

It means pleasure in his work. It means the gilding of dull necessary tasks with delight. More and more in the modern world it has become to be the custom to consider work as merely a means of making money to buy our pleasures with; and we lose sight of the fact that the best of all the pleasures that the world has to offer is in the production of work which we believe to be good. If we are going to spend the greater part of our lives in some pursuit, is it not well to see that we get all the delight out of it we can? That would seem a selfish kind of argument were it not happily true that pleasure in the worker begets pleasure in the beholder too. Is there no room in the modern world for the craftsman? Kipling pictures—

> Who lest all thought of Eden fade
>   Brings Eden to the craftsman's brain,
> To Godlike muse o'er his own trade,
>   And manlike stand with God again.

Let us hope that the artist of the future will find both his work and his pleasure in the creation of the world in which we live—the world of building. Instead of arranging colours on a canvas, let him arrange brick, stone, and wood on hill and dale, in such simple and noble forms that the very spirit of the country will be explained and rendered articulate by his work. Instead of communities of little artistic villas, smugly conscious of their prettiness, let us try to achieve in our smallest buildings those qualities of reality and earnestness which will alone make them seem at home with the creations of nature. And in conjunction with the house builder let us have the garden maker confirming his efforts, not merely in the grooming of suburban villa plots, but in making the wilderness to blossom as the rose. We do not want the dilletante pedantries of architectural art. Let Roman art be for the Romans, and Grecian for the Greek. Here in our Northern clime let us evolve our own art as our fathers did, from our natural conditions of climate and of race.

## LLANDAFF CATHEDRAL.*

By S. BOWEN WILLIAMS, M.S.A.

(*Continued from last week.*)

WE will now return to the roof, which is entirely new. The effect of an open timbered roof is undoubtedly exceedingly fine when viewed in a long, unbroken line, and there is no doubt this effect has been attained by Mr. PRITCHARD. Yet it seems most probable that the original roof was flat. You will note that the vaulting shafts are carried up to the top of the clerestory walls with a moulded cap, and suggest that they carried the heavy beams of a flat ceiling. Had it been stone vaulted the moulded caps would have been placed much below the top of the walls.

Before we leave the nave, a glance might be given to the pulpit, which is of Caen stone and of good design, with some striking figures of St. PAUL, MOSES, DAVID, and JOHN THE BAPTIST.

The font also deserves mention. It was designed by Mr. PRITCHARD'S partner, Mr. J. P. SEDDON, and is a fine piece of work. There are carved on it representations of the Flood and the Miraculous Draught of Fishes.

At the extreme east is the Lady chapel, erected by Bishop DE BRAOSE. It is Decorated work and is vaulted in stone. It is almost entirely original; the east window, which Mr. WOOD had replaced with a wood one, having been restored by Mr. PRITCHARD. The design of this window is based on those of York chapter-house. It is the only part of the cathedral which did not fall into absolute ruin.

The chapter-house is entered from the south aisle and is remarkable in form. It is square, with a central pillar to support the stone vaulting, and is very similar to the great staircase of Christ Church, Oxford. The upper storey is now octagonal and is used for the library. It was formerly square and was used at one time as a schoolhouse.

This completes the interior, and we will now go outside and consider the more important external features.

We will first take the west front. This consists of a gable centre flanked by two towers. The tower on the south side is new; the rest is original. The gable centre is Early English and is the original work. It is a very fine example and one of the most successful in the country. It is divided up in the typical Early English way—a doorway; above, the main range of windows; next, a blind arcade with a central light; and finally, a seated figure of CHRIST in the apex. The proportions are excellent and each part bears a very harmonious relation to the whole. It is similar to Ripon west front, and though Ripon is larger and grander, yet it has not the grace and variety of Llandaff. The poor portal in Llandaff rather spoils the comparison, however. St. Remi at Rheims, before its alteration, was also so similar to Llandaff that it has been suggested that the architect for both was the same man.

The doorway is of unusual form. It consists of two round-headed archways united under a single round arch; and though it would seem that there must have been a column between the two archways, yet the construction of the archstones indicates that this was not so. The vesica contains a statue of St. TEILO or St. DUBRICIUS. The doorway can hardly be called beautiful, though it is peculiar. The mouldings indicate that it is undoubtedly Early English, though its arches are round.

The wall on either side is blank, but above the door comes the main range of windows, which consists of three lights and two blank arches. These fill the breadth of the gable.

Above this and within the slope of the gable is a blind arcade of trefoiled arches, but graduating in such a way that one leaf of each trefoil is missing. In this way the arcade follows in some degree the slope of the roof. The central opening is a window.

(*To be concluded.*)

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* See Illustration.

## ILLUSTRATIONS.

### DODFORD CHURCH FROM THE SOUTH-EAST.

THE new parish of Dodford, Worcestershire, was carved out of the mother parish of Bromsgrove some two years ago. The living was endowed and the church buildings erected through the generosity of a former curate of Bromsgrove, the Rev. W. G. WHINFIELD. The site is on the western slope of a gently-rising hill, facing the Malvern Hills. The house (to be illustrated later) will ultimately be used as the vicarage. It has been planned in a somewhat irregular manner to fit the contour lines of the hill and also to command a singularly charming prospect. The central tower of the house was contrived, on the instructions of the client, to get a view of the Malverns.

The cloister court of the church has an outside pulpit and is used for open-air services in the summer. The rood beam shown in the photo of the interior is made of polished grey wood with emblems in gilded lime-tree carved by Messrs. MARTYN, of Cheltenham. The cross surmounting the beam, of enamels and metals, is the work and gift of Miss AMY WALFORD. The whole of the structural work of the church and house was carried out by Messrs. BRAZIER, of Bromsgrove, from the designs of Mr. ARTHUR BARTLETT. The photos are by Mr. T. LEWIS, of Birmingham.

### CATHEDRAL SERIES, LLANDAFF.—INTERIOR, LOOKING EASTWARDS.

THIS is in continuation of our series of illustrations from Llandaff.

### THE CHAIN GATEWAY, WELLS CATHEDRAL.

THIS is the first of a series of measured drawings by Mr. WESTBYE of the gateway to the Vicars' Close, and was described in the article on "Wells and Glastonbury" in our issue of January 14.

A Sketch by HAROLD OAKLEY.

# COMPARISON BETWEEN ENGLISH AND CONTINENTAL IRONWORK.*

*(Concluded from last week.)*

OBERT BAKEWELL was probably one of his original assistants, but must have seceded before 707, perhaps from ill-health. He adopted Tijou's yle, but diverged from it greatly as time went on. e made a summerhouse for Melbourne, the work on hich was interrupted by long illnesses, and not finished ll late in 1711. He then set up a workshop in Derby, and s work is widely spread over this and neighbouring counties. e hear of him for over a dozen years more, and he probly worked on much longer. Two brothers at Chester folwed more or less in Bakewell's footsteps, and produced some ry important and noble and original forecourt screens. They ay have worked at Drayton House, but so far are first heard some time after Tijou had departed. A very fine smith at ristol had a great vogue round about, and executed splendid ork in the manner of Tijou, though his designs were often eak and bizarre. These men practically monopolised the est Country and the Midlands, but, strange to say, no sciple of Tijou's settled in the Metropolis, and the very stinctive styles these men introduced died out with them.

The English style came into existence and developed side side with Tijou's work. As far as can be traced at present, homas Robinson is the man to be most honoured.

The earliest mention of this name I have yet met with is 1697, when he had produced the beautiful railing to the orning Prayer Chapel in St. Paul's Cathedral. The fine af-shaped spikes on hollow balls, fashioned by the hammer, e latter from sheet iron, and the more massive standards tween, are excellent work in the English spirit. Two years ter we find Robinson supplying the wrought windows for e cathedral at 5*d*. per lb., when Tijou was getting 6*d*. Later her work followed, which it is needless to specify. The thedral accounts show that he was employed until 1711, hen Tijou's departure left him a clear field. In this year was erecting the very fine gate and railings at New College, xford, and an eye-witness records that he was an "inenious" smith, at that time the term of highest praise, and at his works were at Hyde Park Corner. There are thus several works known of his, and from these it is possible to identify many others, though less certainly than in the case of Tijou's followers, whose mannerisms leave us in no possible doubt. Conditions of work in London make it so very easy to appropriate other people's ideas. Other names have come to light, men perhaps taught in Robinson's workshops, and yet others will be discovered, all working practically on much the same lines. Robinson, however, must have had a long career or very capable successors. Indeed, I have been told that the firm continued as a foundry on the site of Victoria Station till the railway took it over. The effects aimed at by Robinson were lofty and perpendicular, never horizontal, and he obtained them not only by carrying the bars to a great height, but by avoiding interruption of their vertical lines by horizontal ones. The piers were carried right up through and interrupting the top horizontal without any break, and were relatively slender and surmounted by high pyramids of scrolls and finials, with perpendicular effects like those of the Gothic architecture around. The finely-designed overthrow to the gates is also aspiring and lofty, and the whole design remarkable for its sparing use of embossed work, a rich appearance conferred by the numbers of sharply crinkled welded water leaves, which diffuse a beaded look over the whole surface. The contrast between this and Tijou's work is very striking, for he and his school never purposely aimed at obtaining commanding and lofty effects by the use of uninterrupted vertical bars, but sought them chiefly through the magnificence and richness of detail of the embossed work.

Robinson repeated his success at Trinity College, Oxford, where little of his work now remains, and it seems safe to regard the fine works at Belton and at Beddington as his, these having similar characteristics. It is more difficult to claim for him the immense screen or grille at Carshalton Park, which presents the most dignified and grandly Perpendicular effect of any screen in England. This is largely obtained by using massive vertical bars for the piers, which are unusually severe, with solid caps and bases, and limiting and concentrating the scroll work with telling effect. It was probably erected after 1723, when plans and elevations for the contemplated mansion were engraved. The design betrays French influence, but further research will, I believe, disclose more facts.

By analogy and inference many of the most scholarly and best designed gates in and around London would be assigned to Robinson. Among them the gates now at Devonshire House, which our valued friend, Mr. Phenè Spiers, has traced back to Lord Heathfield's house at Turnham Green, probably not their original site, whence they were brought in the last century to Chiswick, and quite recently to Piccadilly. There are gates at Clandon Park of the same make, the real history of which is lost in a tradition that they were brought from Naples. I am engaged in classifying and unravelling the history of the numerous gates still existing in London and its environs, now, alas, very rapidly disappearing! This is a difficult task, as appropriation of ideas has always been so easy in London that few distinguishing peculiarities can be relied on.

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* A paper read by Mr. J. Starkie Gardner at the last meeting of e Architectural Association.

One rival to Robinson is a smith, presumably in London, who executed several magnificent works in and around Cambridge and elsewhere, with a sufficiently distinctive style. His name was Warren.

It does not appear so far that any English smiths were directly influenced by French work, except through Tijou, who had been the sole channel, and had introduced by his own example alone a taste for richly worked wrought iron into England. Entirely French at the outset, it was but natural that Tijou, who was a genius, should after twenty years of residence in England and of intercourse with English patrons and architects, bring it somewhat into line with English sentiment, which in the main is wholly different to the French. Those who had been immediately associated in his work followed his ideas and traditions, but these almost died out in a single generation. On the other hand, our smiths, who were onlookers, caught some of his enthusiasm and imbibed his ideas, but had to find out for themselves how to put them in execution. Embossing, for those who were brought up as smiths, was a difficult, tedious and expensive process, and they therefore used it sparingly, their designs being modified to suit their own conditions. Thus was produced the English school of ironwork, of well-knitted, restrained and graceful lines, combining a simple dignity and fitness which harmonised so admirably with the national temperament and general surroundings. The essentially English treatment may be described as refined, and never approaching the commonplace or vulgar.

We were, however, at all times of our history open to receive French fashions and impulses, and ironworking was not altogether exempt. Architecture certainly borrowed much from France, but Gibb's book of architecture, published in 1728, is the first book by an English architect which includes designs for ironwork. Two plates are devoted to forecourt screens and one to gates. The forecourt screen for country mansions, however, had become almost a thing of the past before the book was published, and apparently none of the designs were ever executed. The designs appear to be adapted from the French, particularly from the grilles and gates to the front of Versailles, and are evidently subject to some definite and unexplained rules of proportion, for though variety is obviously aimed at, either design might be chosen indifferently, for all produce the same effect. The details are not all actually different from those then in use by our smiths, but purely French details are recognised in the railing with pike-heads and tassels, and the borders of small circles, of which we have seen so much in our London park gates of late. Massive cast baluster standards are also introduced, like those of the railings to St. Martin's in-the-Fields.

The grand forecourt to Wentworth Castle, built about 1715, with its wide and stately bowed front, also presents a similar sweep of railings to that of Versailles, with lofty gates and wickets in the French taste. These are of long, vertical bars, with the lock-rail low down, under a rich overthrow, horizontally treated, with a pyramid scrolled top comprising the fully displayed arms and supporters of Thomas Wentworth, Earl of Strafford. Many other details suggest French design.

Powis House, in Great Ormond Street, was burnt in 1712, while occupied by the French ambassador, and rebuilt in a sumptuous manner by Louis XIV., who defrayed the cost, though the building was insured. The ironwork is of the utmost richness, and was probably renewed by order of Louis XIV. It is less distinctly French than that to Wentworth, but the fleur-de-lis terminals to the scrolled pyramid tops of the railings, and the magnificent scroll-work buttresses to the gates, &c., are unmistakably foreign. The gates to Newcastle House, in Lincoln's Inn, were also typically French. These have disappeared, and I believe the enclosure to the forecourt at Elvaston is really almost the only one actually of French make existing in England. It is said to have come from the Palace of Madrid, presumably the one near Paris, though I have failed to find any illustration of this château showing such an enclosure.

With the publication of Gibb's book smithcraft seems to have waned. The few gates that are dated are plain and massive, like those to Gray's Inn and the Temple, and of about Gibb's date. The grilles to the Mansion House and Bank of England are heavy and severe. The screen to the forecourt of the Horse Guards was probably designed by Vardy, though illustrated in Ware's "Body of Architecture" in 1756. Two or three guides for smiths published at about this time chiefly reproduced French designs. Batty Langley, in his "Ancient Masonry," took his designs from a German, J. J. Schübler. Jores borrowed from Huquier, and the plates of the "Smith's Right Hand" are also taken chiefly from French sources. Few, if any, of their designs were ever carried out in England.

The links between English and French work do not exist, and it seems owing to Wren, who never took up with florid ironwork, that a more ornate style was not in vogue before the advent of Tijou. It was perfectly clear that we should not have had a decorative school of ironworking in this country had it not been for this designer, and whatever we may think about his designs he was certainly a man who for his time, and considering the contemporary work in France was in the very front rank, and yet so far as we know the whole of his work was done in England, for there was no trace of him in France or Holland. It is a remarkable fact that a man should arrive in England in 1689, with the Prince and Princess of Orange, apparently without assistants, and yet within a year execute a quantity of work, and within two years make the garden screen at Hampton Court. Therefore I think you will feel as I certainly do that to put up a statue on the museum at South Kensington to Huntingdon Shaw, who really, so far as we know, is a myth, is misleading. The greatest search has been made to discover traces of Huntingdon Shaw, but his name is never mentioned in connection with smithcraft.

Mr. **MATT GARBUTT**, who proposed a vote of thanks to the author for his paper, said many of the facts relating to Tijou and the smiths who followed him were quite new, but the illustrations put before them were by no means examples of blacksmithing. The embossing, so characteristic of French work did not involve welding on the anvil, and came near to mortising, which was fitters' work. He thought they were always sorry to have the legends of their youth damaged, and so it was with regret that he heard Huntingdon Shaw described as a myth, yet when they looked at the mass of work done under the name of Tijou it was quite clear that he could not have executed it all; it was the work of many men. The drawings they had seen made by Tijou were hardly so good as the executed iron work, which suggested that h had men to carry out his designs who knew more about smith work than he did. A comparison between English and Continental ironwork might be difficult, and it would have been interesting if Mr. Gardner had explained the actual methods of work, the means by which effects were arrived at. They had recently seen examples of ironwork in Italy consistin of a collection of flat bars gathered together in a bunch an then leading off into scroll work with scarcely any welding It would have been interesting to know the differences in th actual handling of the heavy bar work, and to compare th top of one of the gates at Hampton Court with similar wor in France, for it was of the kind they recognised as Englis work in Chelsea and elsewhere.

Mr. **MAXWELL AYRTON** seconded the vote of thanks, an said he would have liked to have heard something about th fourteenth, fifteenth and sixteenth century work, for i seemed to him that although the later work could clai dexterity of handling, and certainly more strictly architectural treatment in design, yet they lost a good deal of th simple directness of the earlier work, which he thought compelled admiration from the wonderful way in which th designers obtained richness of ornamentation, and yet sti kept within the confined limits of the material. The seventeenth century work failed in that direction. It would difficult, he said, to find more beautiful fourteenth and fi teenth century Spanish and German work than was to be see on their locks and hinges, and all of it was legitimate smith work.

Mr. **GERALD HORSLEY** said the point in the paper whic seemed of importance was that the ironwork which M Gardner described as beginning with Tijou only lasted f about two generations. Tijou was succeeded by Robertso Edwards, Bakewell, and others. About 1728 when Gibb book was published, the school of ornamental ironwork di out. In France, however, the ironwork proceeded along wi the architecture as it did to-day.

Mr. **GARDNER** briefly replied to the vote of thanks, a the meeting terminated.

# THE MEASUREMENT OF ILLUMINATION, DAYLIGHT AND ARTIFICIAL.

## WITH SPECIAL REFERENCE TO ANCIENT LIGHT DISPUTES.[*]

THE daylight and artificial illumination of buildings is a matter which the architect is constantly called upon to determine, and to determine in most cases for the whole life of the building. It is difficult to imagine any building where the decisions of the designer with regard to the shape and size of windows and the provision of artificial illuminants are not of the utmost importance. In schools, libraries, hospitals and workshops the efficiency and sufficiency of the lighting has to be his first consideration, and in very few buildings indeed can he afford to make it a secondary one.

At the same time, rooms which are built with an unduly large proportion of window space can only be warmed in winter with difficulty and at great expense, whilst in summer they are insufferably hot. Even greater care has to be exercised in order to avoid excessive artificial lighting, which is not only expensive but extremely detrimental to the eyesight. The human eye, which will readily adapt itself to very large variations of diffused sunlight, which will read print with equal ease at sunset in December indoors and at noon in June outdoors, is extremely sensitive with regard to artificial illumination, and will be strained and injured by anything outside a very limited range.

One would therefore naturally expect the subject of illumination to have been fully investigated by architects and to receive from students as much attention as the proportions of Greek temples. One would expect that it would be the subject of minute regulations in the London Building Acts and in local bye-laws, in the regulations of the Board of Education, and in the Government requirements for the proper lighting of factories and workshops. It would be expected that in the intensely populated towns and cities of England, where land is valued by the square foot and almost by the square inch, and where a light well costs a modest competence in dead rent, that the limiting angles of good, bad, and indifferent lighting would be known exactly. But this is hardly what we do find. What is the information possessed by the average architect upon the subject of windows? He knows that the window space of every room should be at least one-tenth of the floor space—text books written 100 years ago will tell him that—and he probably knows that the same proportion in schools should approximate to one-fifth. But how many could say what proportion of the outside daylight is enjoyed in any room; how many could say what difference would be caused by any given degree of obstruction, or whether the height of the window head makes any difference? How many can define the relative efficiencies of a square foot of glass in a wall and a square foot of glass in a skylight? How many can tell a client what would be the relative amount of light absorbed by or reflected from wall papers of different colours, or by different kinds of glass?

With regard to artificial light many architects know that a provision of 30 candle-power per square of 100 feet super of floor area is considered ordinary, that 50 candle-power per square gives bright, and 60 candle-power per square gives brilliant effects. But how many can say at what height from the floor the lights should be placed in order to give these effects, what would be the results at other heights, or what would be the effect of using frosted or tinted globes or shades, and whether the result would be the same with many lights or few? Is it too much to say that the ideas of the average architect upon the subject of illumination are almost as hazy as those of other people? If so, then that is saying a very great deal.

There is no technical literature on the subject. The average architectural school gives perhaps one lecture on window areas to third or fourth year students, whilst the subject of different systems of artificial lighting is ignored as completely as it is in the syllabus and papers of the qualifying examinations. One seldom finds illumination referred to in the technical press, and then only in vague and general terms, and as far as the author is aware no architectural institution has ever suggested the formation of a committee to investigate it and collect information.

The Building Act and local bye-laws merely demand a minimum proportion between window and floor area, irrespective of whether such windows are at the bottom of a deep area or overlooking a park. The Regulations of the Board of Education for new schools (1907) are excellent as far as they go, except that they forbid the most efficient possible window, viz., a ceiling light. But they do not go very far and they are absolutely silent upon the subject of artificial lighting. Details for the approval of the Board are required of sanitary arrangements, ventilation, boundary walls, desks, fireplaces, &c., but artificial lighting is not even mentioned. The requirement of the Home Office with regard to the lighting of workshops is that it should be "adequate," which is, to say the least, a little indefinite.

The reason for this state of surprising ignorance is not far to seek. Exact knowledge is impossible without measurements and standards; and the measurement of light has been unfortunately confined almost entirely to the measurement of the intensity of light sources, whilst the measurement of results, *i.e.*, the general illumination to be derived from arrangements of lamps, has been neglected. Hence, we have ample data as to the candle-power of lamps, but no data at all of the illumination at table height which can be secured by using them. A few weeks ago the author asked three well-known electrical firms to tender for the wiring of a village hall on the basis of a given illumination at a certain height above the floor. The reply of each one was to the effect that having no data on illumination they were unable to tender. Text books tell us that illumination varies inversely as the square of the distance between the source of illumination and the surface illuminated. So it does in the laboratory, with single lights and blackened walls, but it does not do anything of the kind in the presence of the reflecting surfaces of walls and ceilings.

In the second place the measurement of such an everyday matter as daylight has not been considered worthy of attention. In consequence, the inaccuracies and vagaries of the human eye remain unknown, and it is commonly regarded as an efficient instrument for measuring illumination. As a matter of fact, the impressions received by the eye are no more an accurate criterion of daylight illumination than a landscape photograph is a measure of the acreage of a field. A piece of printed paper upon a table in the centre of a room upon a fine day appears to be illuminated to very much the same extent as when it is held outside the window. But try to photograph in the two positions; outside it may require, say, one-fifth of a second or less, inside it will probably take five minutes. The photographic plate records a difference in the relative illuminations of no less that 1,500 to 1; to the human eye this enormous difference is almost imperceptible. This is only one instance of the utter unreliability of the eye as a measuring instrument. Many others might be cited. For instance, most people would feel insulted if it were suggested that they were unable to estimate the relative brightness of different classes of sky such as:—(1) Cloudless; (2) blue predominating; (3) clouds predominating; (4) no blue; (5) overcast. But nine people out of ten who were not expert photographers would place them in the wrong order. Very few would expect to find that clouds *increase* illumination, still fewer would believe that the illumination from a cloudy sky is more than double that received from a clear blue.

Again, the effects of different tints of wall paper on the eye are most extraordinary. Nearly everyone would be favourably impressed with the lighting of a room papered in light pink, and would be extremely liable to consider inadequate that of a room with light buff or pale grey walls. Yet the latter colours reflect nearly four times as much light as pink. Certain wall papers mean a very considerable difference to one's bills for artificial light.

How many people would hold up the Strand Law Courts as an example of daylight lighting? But try and read a piece of fine print at sunset in the witness-box or counsel's seat of any of the Courts, and afterwards try it at the same hour in the centre of an ordinary office with large windows; the difference is surprising. The chief reason for this is that the windows are high up in the walls, and the enormously high relative value of high angle light is a matter of which the eye takes little notice, and which is seldom properly recognised. Its effect, however, can be easily studied by darkening different parts of any ordinary window with brown paper screens. The loss of the bottom two or three feet in height will hardly make any difference at all, but shutting off a few inches from the top may reduce the general illumination of a room by 30 to 50 per cent.

It will sometimes be found that high rooms on lower floors with badly restricted horizons are actually *lighter* than low rooms on upper floors with the same proportion of glass to floor area and with absolutely open horizons.

In this connection it might be mentioned that the ordinary north light roof would be very much more efficient if the flatter slopes were turned to the north and glazed. The illumination would be greatly increased, and the workman would not stand in his own light when facing south.

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[*] A paper read by Mr. P. J. Waldram, F.S.I., before the Society of Architects on January 13.

The daylight illumination of every room varies by several hundred per cent. from sunrise to noon and from noon to sunset; and it also varies from day to day and from month to month. But the wonderful adjustable iris diaphragm of the eye deliberately stops down all illuminations which are above a common level of efficiency, so that the mind is quite unconscious of these large middle-day excesses of illumination, and may very well remain ignorant of them.

A very little consideration of these facts will show that unaided visual impressions are quite worthless as a criterion of the daylight illumination of any room, and how extremely unlikely it is that different experts, trusting to their eyes alone, will arrive at the same opinion; for it is no exaggeration to say that there are few experts who know how to *mistrust* their own eyes to such a degree as will enable them to form approximately reliable opinions.

Fortunately, however, the daylight illumination of interiors can be measured in spite of its constantly fluctuating character; because the proportion of the outside daylight which any room receives is always a fixed ratio. As sky brilliancy increases and decreases, so does the interior illumination, and in precisely the same proportion, except when the room is lit by the direct rays of the sun or directly reflected rays. If the middle of a room receives $\frac{1}{1000}$th of the outside light at sunrise in December, it receives $\frac{1}{1000}$th at noon in June. This proportion is also the same in a scale model of the room as in the room itself. All that is required is a photometer with a large adjustable range and which will record not candle-power but illumination in candle-feet, viz., degrees of illumination equivalent to so many standard candles at a distance of 1 foot.

The chief object of this paper is to show that the measurement both of artificial and daylight illumination is such a very simple matter, requiring neither special skill nor expensive apparatus, that it ought to be largely undertaken by architects. The photometry of lamps and other light sources demands very delicate and expensive apparatus, specially constructed laboratories, and the exercise of technical and mathematical ability of no mean order. But the photometry of lamps is a matter for the engineer and not for the architect; he is concerned with the results, not the means. The photometry of illumination, both daylight and artificial, can be performed with instruments of about the same size, weight, and cost as a good hand camera; and demands neither technical skill nor mathematical knowledge.

The principle of illumination photometers is to compare the illumination which falls upon a card outside the instrument with the light of a standard electric lamp inside, and viewed through a slot in the same card. The light of the standard lamp is graduated by turning a milled head at the side of the instrument until the illumination of the slot is equal to that of the rest of the card. The same operation turns an index needle on a dial which automatically indicates the degree of illumination in the slot. The difficulty of balancing lights of different colours is in most instruments met by passing the light through a rapidly rotating sector. The resulting flicker is, however, not a little trying to the eyes, and the author prefers the well-known Preece-Trotter type, in which the difficulty is overcome by using slotted cards of different standard tints.

The author described this instrument in detail, with the aid of a diagram.

The following are a few examples of inside and unrestricted outside illumination:—

*Proportion of Unrestricted Outside Illumination Received by Interiors of Buildings.*

| | |
|---|---|
| New Suburban Elementary Schools: | |
| Children's desks | 0.0025 to 0.008 |
| New Urban Technical School: | |
| Class rooms, ground floor, average | 0.001 |
| Upper floors | 0.002 to 0.004 |
| Ordinary offices, centre of rooms, average | 0.001 |
| British Museum, reading room | 0.007 |
| ,, ,, Entrance hall | 0.0017 |
| Patent Office Library: | |
| Centre of reading room | 0.005 |
| Reading alcoves and galleries | 0.0007 to 0.008 |
| Royal Courts of Justice: | |
| Middle of central hall | 0.0012 |
| Courts—Judges' seats | 0.0007 to 0.0022 |
| ,, Counsel | |
| ,, Solicitors | |
| ,, Jury and witnesses | |
| House of Commons: | |
| Clerk's Table | 0.0008 |
| Speaker's Chair | 0.0009 |
| Behind do. | 0.0002 |
| Members' seats | 0.0003 to 0.0007 |
| House of Lords: | |
| Woolsack | 0.0006 |
| Members' seats | 0.0004 to 0.0006 |
| Members' Lobby | 0.001 |
| Lords' Lobby | 0.0004 |
| Central Hall | 0.0015 |
| Committee Rooms (centre) | 0.004 to 0.005 |
| Westminster Hall (centre) | 0.0012 |
| Charing Cross Station (booking hall) | 0.0001 to 0.0003 |
| Surveyors' Institution (centre of library) | 0.0015 |

In cases where the obstruction of the visible horizon has already taken place, the proportion of light still remaining can be compared with that of other rooms in the neighbourhood; but the more customary problem is to estimate the future damage of a proposed obstruction. This can be ascertained in three ways.

(1) By erecting the proposed obstruction in the form of temporary screens and noting their effect on the percentage of light enjoyed.

(2) By reproducing the room and its aspect in a scale model and similarly noting the effect.

(3) By deducing the damage from known and recognised data of the difference caused by any given degree of obstruction.

The first two methods are comparatively simple, and they are the only ways open to us at the present time; but if we only had the data referred to in (3) the trouble, anxiety, and needless expense of ancient light disputes might be avoided altogether, and at the same time one of the greatest difficulties connected with town building would become a matter of simple calculation.

Finally we have to consider what is the real effect of any given obstruction. Over the greater part of the working day it is negligible, for if a room be lit at all at sunrise and sunset, then it has a very large excess between those hours. It may suffer æsthetically, and in rental value, from loss of prospect; but prospect is not an easement.

The real loss, as regards reading, writing, and industrial occupations, is that more artificial light will be required in the morning and evening. The extent of this loss can only be exactly arrived at if the average of increase and decrease of outside daylight be known. There is need for exact and authoritative data, but approximately this may be put at a rise or fall of about 1,000 candle-feet in 45 minutes on clear days in June, and in 180 minutes in average weather in December. In other words, at a point in a room enjoying $\frac{1}{1000}$th of the outside light the illumination would increase and diminish at the average rate throughout the year of about 1 candle-foot per 120 minutes. But a room only enjoying half that proportion would require twice as long to acquire a working light in the morning, and would lose it so much sooner in the evening.

A rough approximation of a standard well-lit room would be one enjoying an average of 1 candle-foot (*i.e.* a fair reading light) at half an hour after sunrise and at sunset on a clear day, which is given by a proportion of about $\frac{1}{1000}$th of the outside illumination.

The great present-day need is that architects should take an active and intelligent interest in illumination. They can at least insist that gas and electric sub-contractors should guarantee a given illumination at table height in candle-feet. The demand will soon create the supply, and instruments for testing the results are neither expensive nor difficult to use. But, above all, we need workers who will record data and results. Architects, and architects alone, can do this satisfactorily, and their labours would benefit not only their own profession, but the whole of the working community.

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THE Royal Institute of the Architects of Ireland held their annual dinner in the Shelbourne Hotel, Dublin, last week. The President, Mr. Frederick Batchelor, presided. Among the guests were the President of the Incorporated Law Society, the President of the Royal College of Surgeons, the President of the Royal College of Physicians, the President of the Chamber of Commerce, the President of the Architectural Association, the President of the Institute of Civil Engineers.

THE Dublin Corporation have once more referred back a proposal for the erection of new municipal offices. The scheme was to utilise the site in Lord Edward Street purchased for the purpose some years ago, and to spend at least 50,000*l.* on the building.

## GUILD OF ARCHITECTS' ASSISTANTS.

IE inaugural meeting of the Manchester branch of the Guild of Architects' Assistants took place last week at rooms of the Manchester Society of Architects, with Mr. E. Corbett, A.R.I.B.A., in the chair. The Chairman ressed himself as being in general sympathy with the ects of the Guild, but in regard to education he thought t assistants might well leave the question to older men, who had more experience of actual practice. He also gested that the insurance programme of the Guild might y well be extended to sick and death insurance, and the rth object of the Guild, that of the formation of a leral Council of all existing societies, he regarded as very ious of accomplishment. Mr. Herbert Cox, a member of provisional committee of the Guild, then delivered an lress explaining its objects and methods. He pointed out arrival of a purely commercial type of principal who was only entering into competition with, but gradually eezing out the older men, and had proved themselves more ely to expect an assistant to work under irksome conditions h as to salary and employment. The report of the pro- ional committee was then read and the procedure of the ild in the matter of employment bureau and insurance fully described. The R.I.B.A. examinations were then icised by the speaker and the examination in steel work cially referred to. He hinted that the character of the minations would be much improved by the introduction paid examiners. The object of the Guild was to set up a re exclusive standard and to assist only those actually hin the profession. The movement in relation to the posed Federal Council could only be brought about by a ong organised body of assistants, and then their case education as well as for other, perhaps more important, tters would obtain the official recognition of the profes- 1. The meeting was then thrown open to discussion, in course of which the Chairman stated he had recently ertised for an assistant and found his own Society in- quate. He had received many replies from men who had n in practice for themselves, and some had held good vernment appointments. It was shown that the scheme unemployment insurance would be managed by a special -committee of the finance committee, the members of ich would only be elected by those participating in un- ployment benefit. There would be no place for the astrel," because the qualifications of all members would carefully studied. The committee for the branch was n elected, Mr. P. Caminesky, A.R.I.B.A., 24 Brunswick eet, Chorlton-on-Medlock, Manchester, as hon. secretary. meeting closed with a vote of thanks to Mr. A. E. bett, the Chairman, and to Mr. Herbert Cox of the pro- ional committee.

## REINFORCED-CONCRETE CHIMNEY CONSTRUCTION.

HE seventh general meeting of the Concrete Institute was held at the Royal United Service Institution, hitehall, S.W., on January 20, when a paper on "Rein- ced Concrete Chimney Construction" was read by Ernest Matthews, A.M.Inst.C.E., F.R.S.Ed. (Borough Engineer Bridlington). The chairman was Mr. W. T. Hatch.

In his introduction Mr. Matthews stated that reinforced crete was considered by American engineers and archi- ts to be suitable for the construction of chimneys. This ght be gathered from the fact that during the past seven rs one firm alone had erected nearly a thousand such mneys in America, under the direction of some of the st able engineers and architects in that continent. The ject-matter of this paper he divided into—(*a*) The ad- itages of using reinforced concrete for the construction of mneys; (*b*) the erection of reinforced concrete chimneys Great Britain; (*c*) a tabulated statement giving particu- s of a number of these chimneys constructed in the United tes; (*d*) the methods of calculating the stresses and ains in such chimneys, and reason for the recent failure a shaft in the United States; (*e*) the effect of excessive t upon concrete and reinforcement; (*f*) general notes h respect to reinforced concrete chimneys.

It had been found in America that reinforced concrete mneys could be built by a well-organised firm at less than -half the cost of a brick shaft, and that the larger the ft the greater the saving, since a large brick chimney of siderable height must have brickwork of great thickness its base to prevent overturning. It was also usually nd that in districts where brickwork was expensive con- te was also costly, so that there was no difference in the ratio of their respective cost. It would appear, therefore, that on the ground of economy reinforced concrete had much to recommend it as a material for the construction of chimneys.

Saving of space was often a great consideration. In a shaft 300 feet in height, for example, the brickwork at the base, according to the building regulations of our English cities and boroughs, would be about 4 feet 10 inches, whereas the thickness of the walls at the base of a reinforced concrete chimney would probably be as follows: outer wall 9 inches, inner wall 5 inches, with a space of 4 inches between the two walls. Therefore considerable economy of space was attainable by the employment of reinforced concrete for chimney construction.

In addition it had less weight than brick shaft. This naturally arose out of the foregoing, and was a matter of the greatest importance where a treacherous soil had to be built upon.

Reinforced concrete chimneys had been erected in the United States for some years past, and the author knew of only one failure. Reinforced concrete lent itself admirably to chimney construction, a recommendation which could not be so confidently asserted with regard to brickwork. The author considered that a reinforced-concrete chimney, if properly designed, was of greater stability than one built of brick, since the former had no joints, whereas in a brick shaft failure might occur at any of the joints.

Once erected, reinforced concrete chimney shafts required practically no repairs, while steel-plate chimneys required painting about every four years, and brick chimneys occasionally required repairing.

The rapidity of execution of work was well known; a reinforced concrete chimney could be erected in half the time that it took to build a brick shaft.

The author then referred very briefly before giving American examples, to one or two of the reinforced concrete chimneys which had been erected during the past few years in this country. Several of such chimneys might be referred to, but the object of the paper was to deal chiefly with those erected in the United States, so that only a few were mentioned.

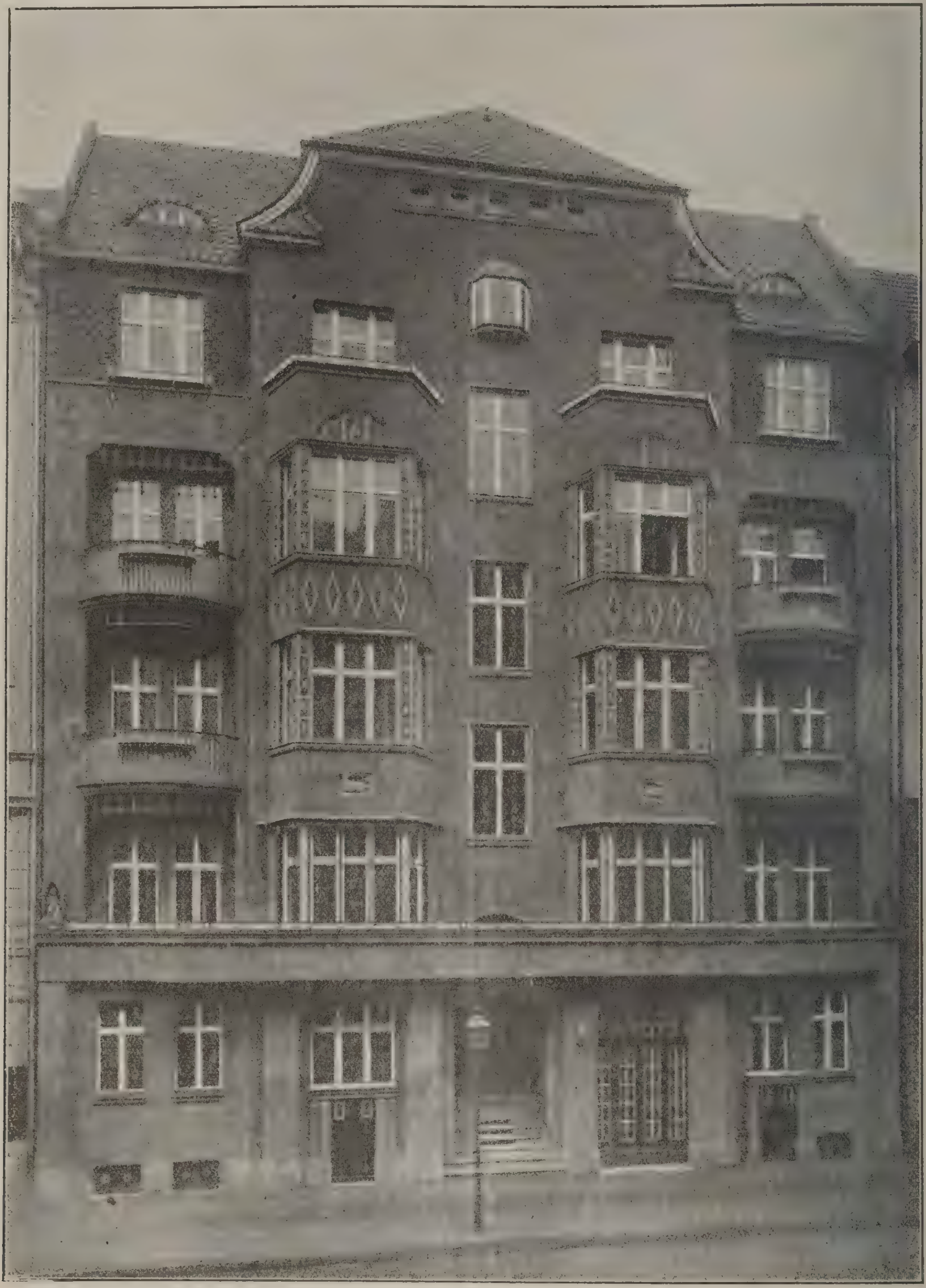
The shaft erected a short time ago at the works of Messrs. Abraham Lyle & Sons, Ltd., of London, E., was a good example of what could be done in reinforced concrete. This chimney was 261 feet in height and 20 feet in diameter. The walls, for the upper two-thirds, were 8 inches in thickness, double walls being built in the lower third. The reinforcement consisted of vertical bars consisting of $1\frac{1}{4}$ inches × $1\frac{1}{4}$ inches × $\frac{3}{16}$ inch T's, and horizontal rings of $\frac{5}{8}$ inch steel rods spaced at 18 inch centres, vertical bars extending into the concrete foundations.

The chimneys recently erected for the Cape Copper Co., Briton Ferry, Glamorgan, and for Messrs. J. & S. M. Greeves, Ltd., of Belfast, were also good examples. The dimensions were as follows:—Heights, 150 feet and 200 feet; diameters of outer shells, 13 feet and 8 feet 6 inches respectively.

A large chimney at Northfleet had recently been erected; it was 8 feet 6 inches inside diameter, and 247 feet in height above bottom of foundations, and was a fine example of reinforced concrete construction. The foundations, the bottom of which were 35 feet below ground-level, were remarkably shallow, being only 4 feet tapering to 2 feet in thickness, and 18 feet × 18 feet in area. A 6-inch baffle wall was constructed across the lower portion of the shaft, and the thickness of the shell up to 62 feet above the ground-level was as follows:—Outer shell, 12 inches; cavity, 4 inches; inner shell, 4 inches. Above this the chimney consisted of a single shell 9 inches in thickness. The reinforcement in the foundations consisted of $1\frac{1}{4}$ inches × $1\frac{1}{4}$ inches × $\frac{3}{16}$ inch T's, and in the shell of horizontal rings of steel $\frac{5}{8}$ inch diameter, spaced 18 inches apart, and vertical bars formed of $1\frac{1}{4}$ inches × $1\frac{1}{4}$ inches × $\frac{3}{16}$ inch T's.

Although a smaller chimney, 130 feet high, the one recently erected at the Bevan's Works, Northfleet, was of much interest. The shallow depth of the foundation was rather remarkable. While this was 15 feet 6 inches square in area, the depth was only 3 feet tapering to 2 feet. The inside diameter of the chimney was 5 feet. The bottom of the foundation was 16 feet below ground-level, and this was reinforced by $1\frac{1}{4}$ inches × $1\frac{1}{4}$ inches × $\frac{3}{16}$ inch bars. For a height of 41 feet above ground-level the outer shell was 6 inches, the inner 4 inches in thickness with a 4-inch cavity between; 9-inch diameter air inlets occurred at intervals; above this the chimney consisted of a single shell only 5 inches in thickness. The shell was reinforced by means of vertical bars and horizontal rings, the former being

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Berliner Architekturwelt.*

FLAT-RESIDENCES, CHARLOTTENBURG, BERLIN.—Façade designed by Rudolf Maté, Architect.

deflected around smoke flues. The vertical bars consisted of 1¼ inches × 1¼ inches × 3/16 inch Γ's, the rings being ⅝ inch diameter steel rods placed 18 inches apart. At the bottom of the offset flat rings 3 inches by ½ inch were inserted.

The two foregoing shafts had been erected for the Associated Portland Cement Manufacturers, Ltd., at their works at Northfleet.

An excellent article, entitled "The Design of Ferro-Concrete Chimneys," appeared in *Engineering* in March 1908. In this the authors—Messrs. Taylor, Glenday, and Faber—describe in detail the methods of calculating the stresses in chimneys of this material. There was not sufficient space in the paper in which to deal with this part of the subject, and Mr. Matthews therefore referred members to the before-mentioned article.

With regard to the recent failure of a chimney in the United States the conclusions arrived at by the authors before named were interesting and instructive. They said:—"It would appear, therefore, that while the thickness of concrete was ample, there was not nearly enough steel t ensure safety, and, of course, this deficiency in steel greatl increased the pressure on the concrete by throwing the lin of zero stress away from the centre of the chimney, and thu leaving a very small proportion of the section in compression. . . . The failure of this chimney cannot be said t cast any reflection upon the use of properly designed reinforced concrete for such structures."

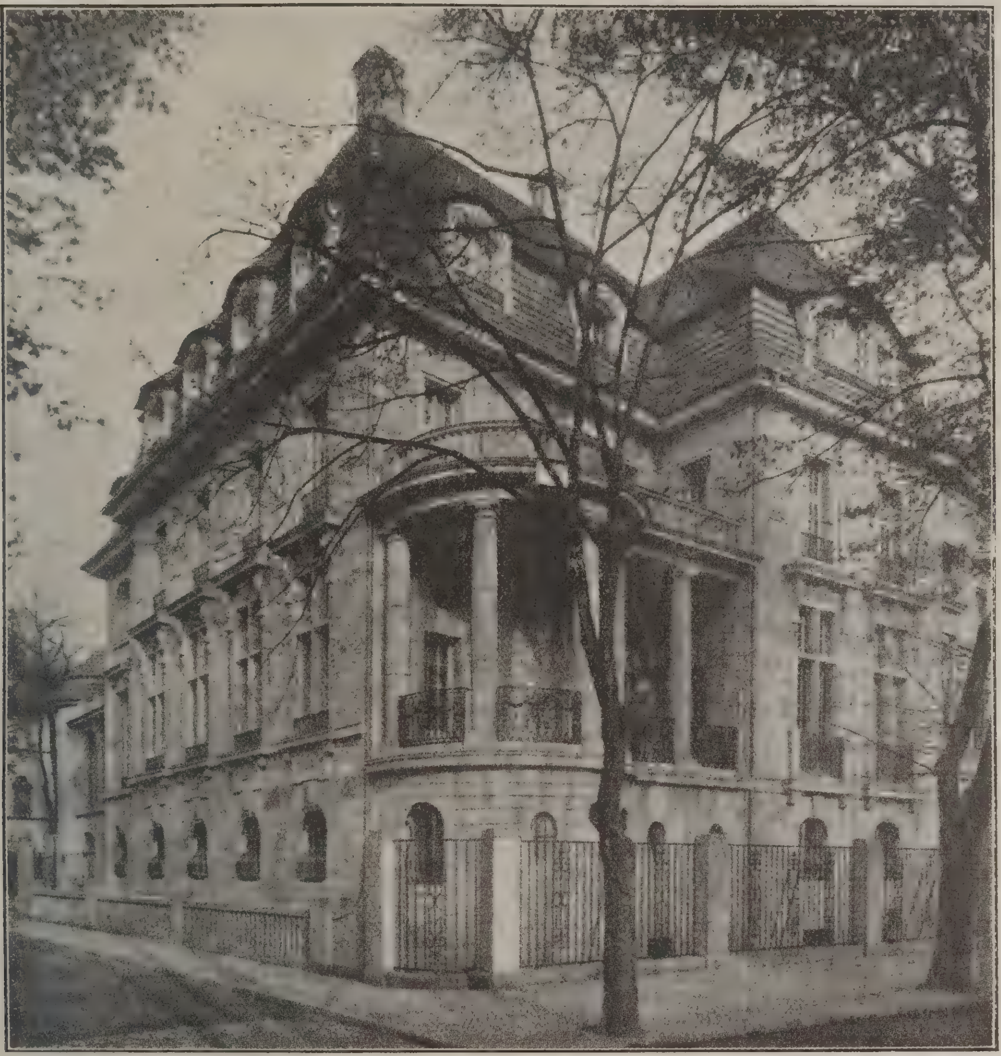
The effect of high temperatures being such an importan matter, Mr. Matthews, in order to obtain some reliable data determined to carry out series of tests, and he gave detaile particulars.

Some most useful information regarding the condition o the concrete and reinforcement in an existing reinforce concrete chimney was supplied by Mr. H. K. G. Bamber F.I.C., of the Associated Portland Cement Manufacturers Ltd.

In order to ascertain if concrete deteriorated through th effects of heat, Mr. Bamber inspected on several occasions th

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Berliner Architekturwelt.*

MANSION AT CORNER OF KONIGIN-AUGUSTA STRASSE AND HILDEBRAND STRASSE, BERLIN.
Hart & Lesser Architects.

face of the concrete shell inside the reinforced-concrete chimney at the works of his firm at Northfleet, and he failed to observe any signs of deterioration. Not contenting himself with this, he subjected the ash in this chimney, on various dates, to an analysis, and compared this with an analysis of the ash taken from the base of a brick Custodis shaft, also at his firm's works at Northfleet. The comparison was most interesting; there was very little difference in the percentage of insoluble residue present, which residue would, of course, include any portions of sand that might, from deterioration, be coming away from the inside of the inner shell of the concrete chimney.

Mr. Bamber had a small hole cut out for the author in the base of the inner and outer shells of the reinforced-concrete chimney at Northfleet for the purpose of exposing a portion of the reinforcement. These were made just over the flue opening where the heat would be most likely to affect the concrete. The result was most satisfactory, the steel being in as good condition as when first inserted in the concrete.

*(To be concluded.)*

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* devotes its illustrations to domestic work of no very great interest, but there is an interesting article on "The House and Its Environment," written around one of the houses illustrated.

*La Construction Moderne* has some views of old Italian doorways of the late Renaissance period selected from Milan. In the current description of old Paris, the Rue Saint-Jacques is now dealt with.

*Arkitektur og Dekorativ Kunst* has some photographic illustrations of the carved figure grotesques executed for Trondhjem Cathedral under the direction of the architect, Olaf Nordhagen, by W. Rasmussen. Furniture from the designs of the architect, Carl Berners, is also illustrated.

*Moderne Bauformen* makes a special feature of the work of Rudolf Schmid, of Freiburg in Breisgau, who does not despise the detail of the past, though much of his work has the meritorious simplicity of those who do. There are some excellent examples of modern interiors, and Henry Wilson, Edgar Wood, Heywood Haslam and Ernest Newton are all represented by examples of their work.

*Stone*, besides dealing, as usual, with some of the quarries in the States, illustrates as examples of the use of stone the Astor Hotel and the Harkness residence at the corner of Fifth Avenue, Seventy-fifth Street, New York.

*Zodtchy* illustrates plans and details of some modern hospitals.

*Engineering Record* has two interesting papers of a practical, scientific character, one by Mr. Albert Moyer on the "Possible Use of Mineral Oils Mixed with Concrete," the other on the "Effect of Superheated Steam on Metals," as discussed at a meeting of the American Society of Mechanical Engineers.

The Council of the Royal Glasgow Institute of the Fine Arts have under consideration a suggestion that the Institute should acquire ground and erect for itself galleries of a spacious and dignified character, and of a size which would enable its exhibitions to maintain their pre-eminent position in the provinces.

# Correspondence

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

### Financial Loss to Architects caused by Competitions.—Suggested Remedy.

SIR,—It has recently occurred to me that the profession does not realise the enormous waste of time and money which is due to competitions; and as the "Regulations for Architectural Competitions" are now under consideration by the Institute, I take the opportunity to draw attention to the financial loss, with the hope that some means may be found to minimise it.

Take a typical case of 10,000l. competition for a limited number of ten; the average out-of-pocket expenses would be at least 20l. each, or a total of 200l., the average value of the designs say 100l. each, or a total of 1,000l. That is, the competitors pay 200l. in expenses, or give 1,000l. value of designs for one of them to receive instructions to carry out the work with a commission of 500l. If the competitors be twenty-five in number then they pay as much in expenses—500l.—as is the commission. Take a 10,000l. unlimited competition; the number of competitors is almost certain to be fifty, when the expenses at 20l. each would be 1,000l., and the competitors pay twice as much out of pocket in expenses as is received by the successful architect, and prepare designs worth 5,000l., or half the value of the building to be erected. If there be 100 competitors, which is not unusual, then they pay in expenses 2,000l., one-fifth of the value of the building, and prepare designs worth 10,000l., the full value of it.

The competition for the London County Hall was a most severe tax on the profession. The design which I prepared cost 320l. in out-of-pocket expenses, allowing nothing for my own services, and much time given to it. I am told that other designs cost double that sum. But take the 320l. as an average, then the 199 competitors paid 63,680l., which is 20,180l. more than the 5 per cent. commission on the 850,000l. proposed expenditure on the building. If each competitor had put 320l. into a sweepstake, Mr. Ralph Knott might have drawn a prize of 63,680l. instead of a commission of 43,500l., and would have had no further work and responsibility; and the other 198 competitors would have saved all their time and thought in the preparation of useless designs, the value of which cannot be put at less than 1,000l. each, or 198,000l.

I notice considerable difference in the comparative affluence of members of other professions and of architects, and incidentally in their social position, and I attribute this to the unproductive labour and expenses of competitions. I doubt if there is any other profession or trade which does so much without remuneration, except perhaps the medical profession, and they have the satisfaction of doing good to their fellow men, and are not called upon to pay the hospital expenses. We brighten our wits and give the younger men a chance by competitions, but the promoters are the supposed gainers; so long as we offer so much for so little, they naturally accept it. I think, however, that we should have the sympathy and help of promoters in any proposals to minimise the loss to the profession, if the regulations were reasonable ones, issued with the authority of the Institute, and as loyally supported by the profession as is the recognised scale of commission.

The remedy I have to suggest is that a scale of the approximate value of payments for out-of-pocket expenses should be adopted by the Institute (ranging from say 1l. per cent. for a 1,000l. building, to 1s. per cent. for a 850,000l. building) payable by promoters of all competitions, and made part of the contract between promoters and competitors, and that members of the Institute should be required not to compete unless such contract were entered into by the promoters.

I would apply this scale to the three classes of competitions named under clause 5 of the "Regulations for Architectural Competitions" as follows:—

(*a*) By advertisement and unlimited, half the scale to each competitor sending in a bona-fide design and complete drawings.

(*b*) By advertisement and limited by selection, the full scale.

(*c*) By personal invitation and limited, the full scale plus a specified sum for the design.

The sums payable by the promoters would be very small in proportion to the value of the designs obtained by them. For a 1,000l. building there could be obtained five designs for 5 per cent. extra to the usual commission; for a 10,000l. building, say at 4s. per cent., there could be obtained twenty-five designs for an extra 5 per cent., or ten designs for an extra 2 per cent.; and the London County Council could have had their 199 designs for 42,188l., practically an extra 5 per cent., a large sum for them to pay, but over 20,000l. less than what the competitors probably did actually pay for out-of-pocket expenses.

The obligation to pay on such a scale would no doubt deter the promoters from indulging so frequently, readily and often unnecessarily in the luxury of a competition; it would also tend to limit and to reduce the number of competitors.

The payments made by the promoters of each competition would be little and due by them, but the aggregate increased annual income to the profession would be very substantial and due to them.

Incidentally the limitation would cause more careful selection of competitors, and improve the chances of those selected.

It has been suggested to me that these proposals might not commend themselves to promoters. But if supported by a regulation of the Institute many promoters would accept the scale as a matter of course, and if any did not do so members of the Institute could then without offence decline to compete. At present I find I cannot decline without liability to give offence to some good friend or other who has brought my name to the notice of the promoters, and consequently sometimes I do compete under conditions which I feel to be humiliating. The Institute by improving its regulations is at the least helping us to help ourselves.

I am taking the unusual course of writing a similar letter to the editors of each of the professional papers, and have to ask for your indulgence for doing so, as I wish the whole profession to have the opportunity of considering my suggestions before the meeting of the Institute on February 7, when the "Regulations for Architectural Competitions" are to be considered.—Yours faithfully,

January 25, 1910. EDWARD M. GIBBS.

### The Japan-British Exhibition.

SIR,—The Japanese exhibits under the auspices of the Imperial Japanese Government at the Japan-British Exhibition at the White City next summer promise to be a complete demonstration of the progress made by that wonderful nation. It is absolutely necessary, therefore, if we as a nation are to be adequately represented, that immediate steps be taken to render the British exhibits an equal demonstration of the progress made by the United Kingdom. As president of the Section of Public Health and Sanitation, I hope you will allow me to call the attention of all those who are engaged in matters which come within the scope of this section to help in making it worthy of the occasion. Great Britain is the leader in all matters connected with hygiene, and it is hoped that this section will adequately exhibit all that our most advanced sanitarians are doing. The Japanese Government and people are keenly interested in all matters connected with public health and sanitation, and already are purchasers of our sanitary goods, and are anxious to know where the most perfect appliances can be obtained. It is with a view of calling upon the patriotism of sanitarians to see that this section worthily represents the place that Great Britain holds in sanitary science that I venture to make this appeal to them.—Yours faithfully, H. D. SEARLES-WOOD,

Chairman, Public Health and Sanitation Section,
Japan-British Exhibition.

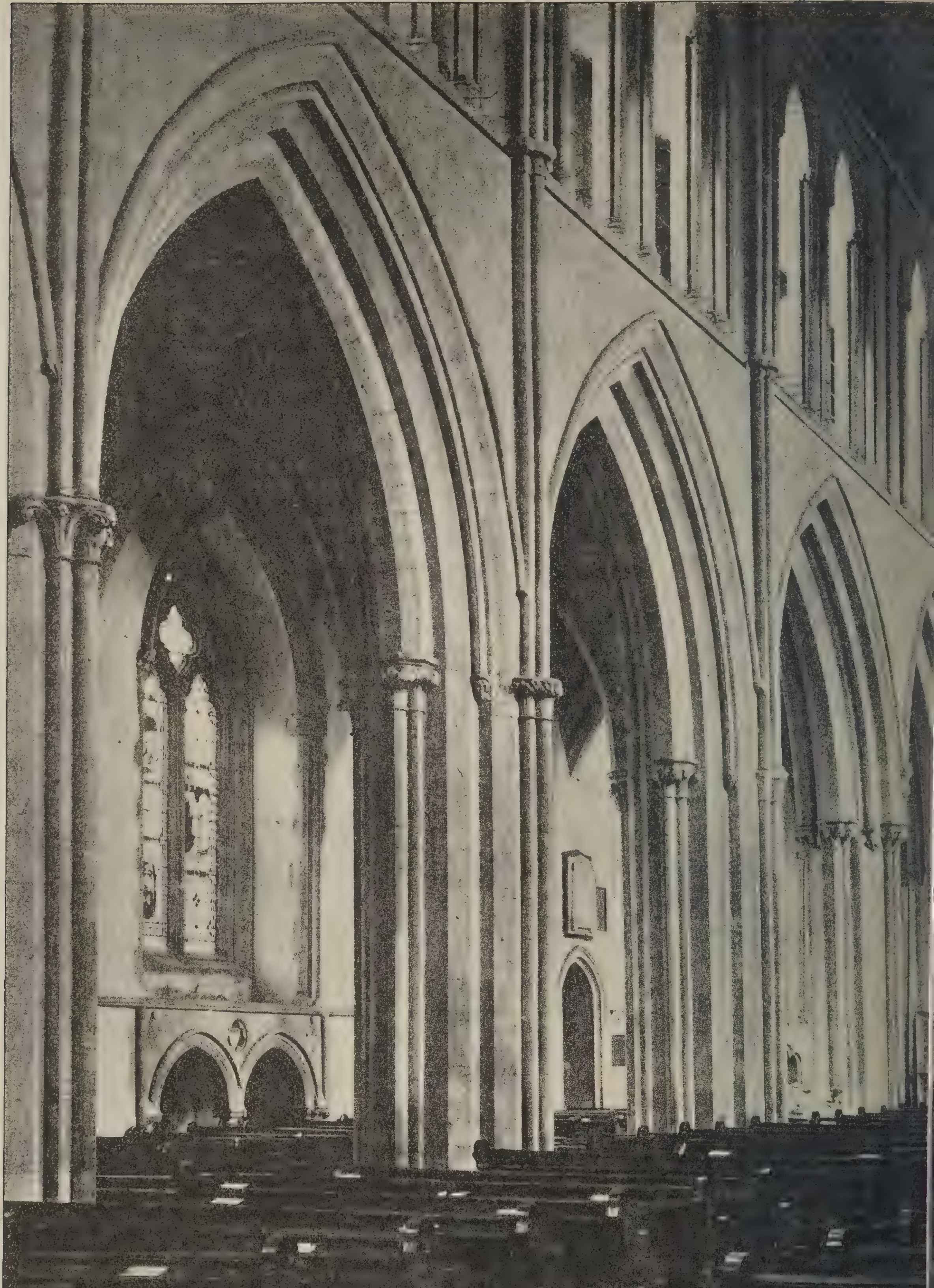
January 25.

## GENERAL.

THE Swiss Federal Chamber have issued the programme of a competition for the erection of a monument at Berne to commemorate the foundation of the International Telegraph Union. The competition is open to all artists in the world, and an international jury, on which Sir George Frampton, R.A., is the British representative, will pronounce on the merits of the designs submitted. The artist chosen will be entrusted with the execution of the monument at a cost not exceeding 6,800l.

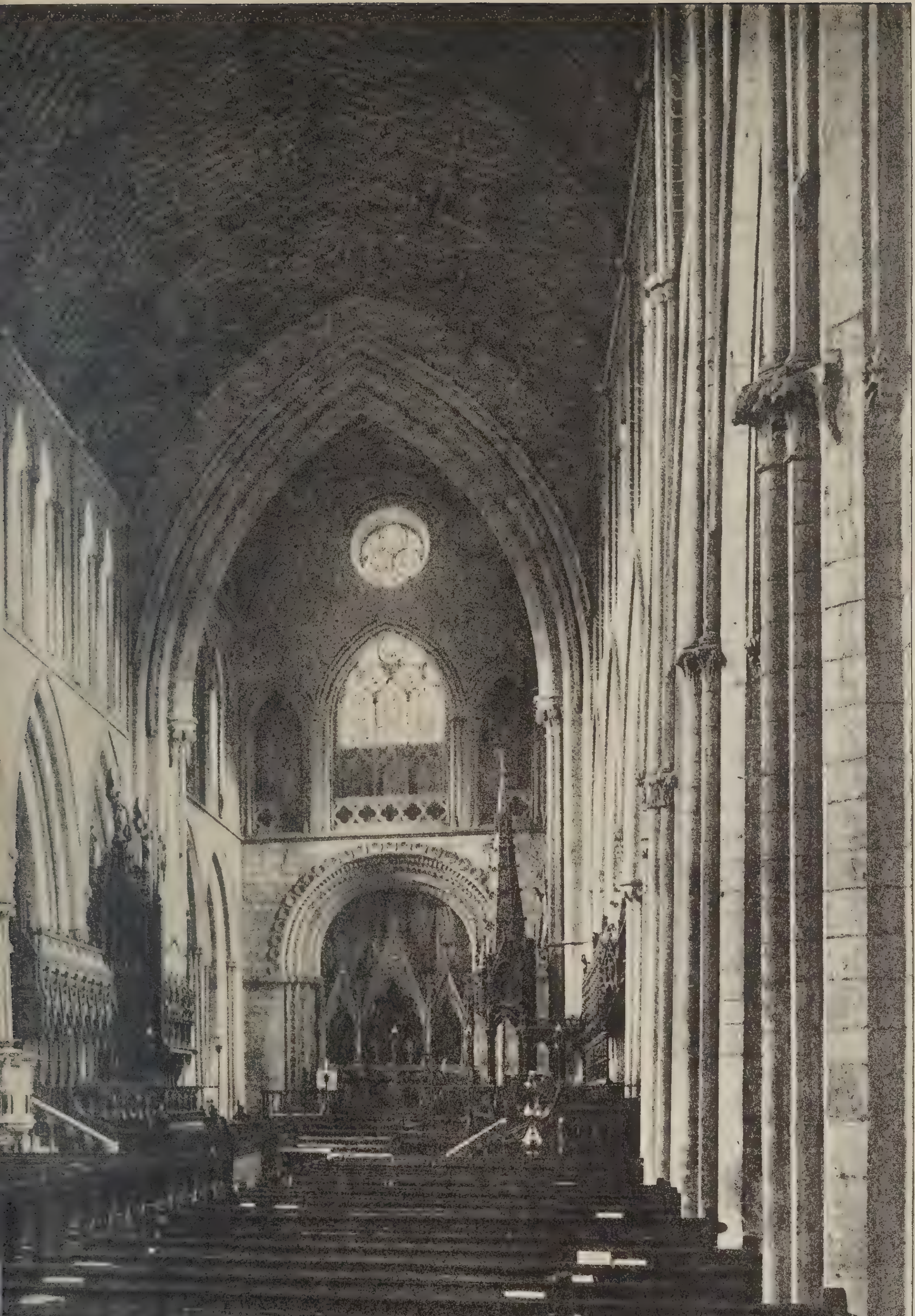
THE late Mr. H. Bayly Garling, F.R.I.B.A., Folkestone, has left estate of the value of 21,363l.

MR. R. A. BRIGGS, F.R.I.B.A., announces that he has taken into partnership Mr. Harry Le C. Browning. The firm will be known as Messrs. R. A. Briggs & Browning, and will conduct business at Amberley House, 12 Norfolk Street, Strand, W.C.



CATHEDRAL SERIES, No. 658.—LLANI

28th 1910.



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Interior, looking Eastwards.

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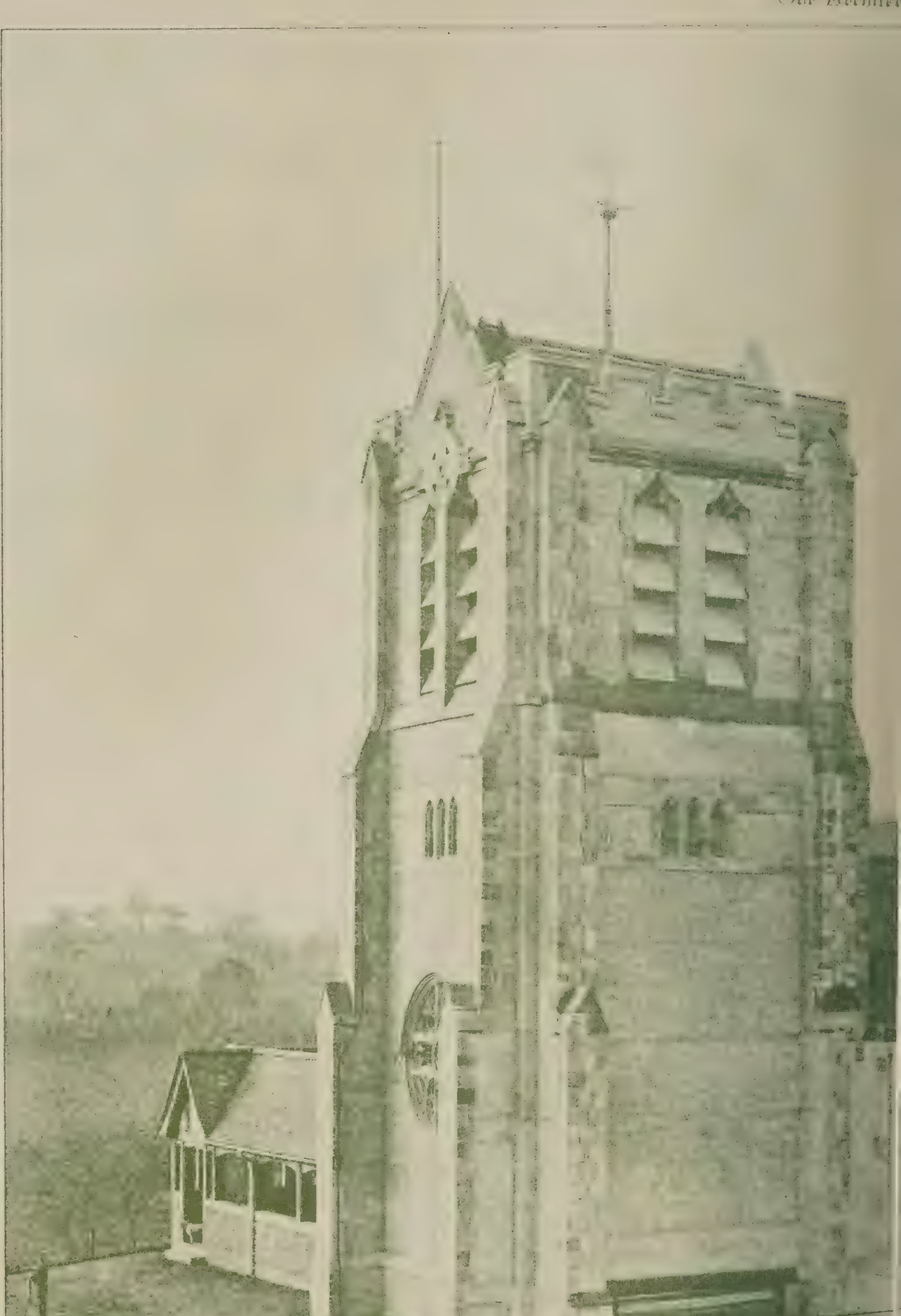
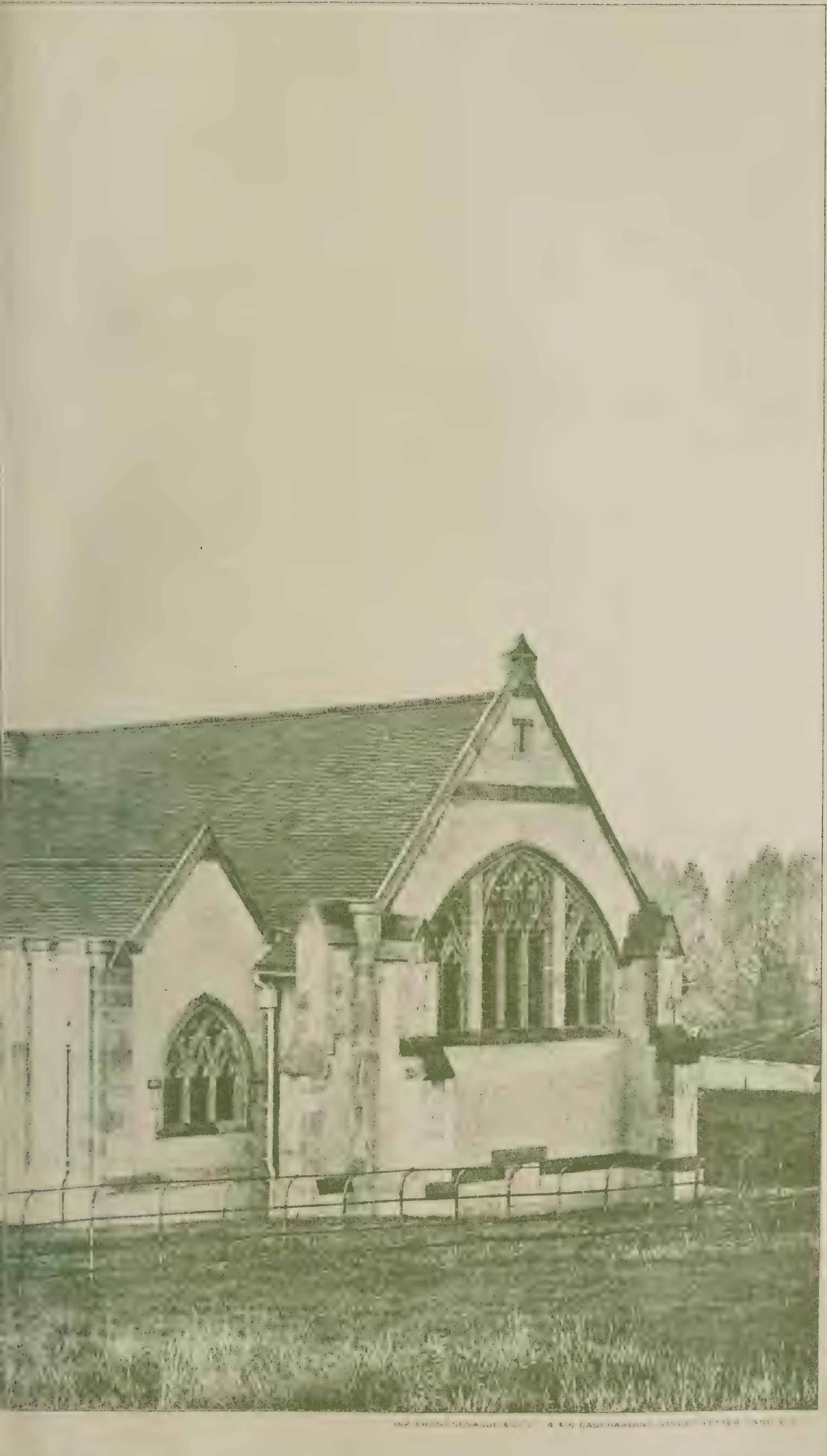


T. LEWIS, PHOTOGRAPHER BIRMINGHAM.

DODFORD CHURCH

Mr. ARTHUR BAR



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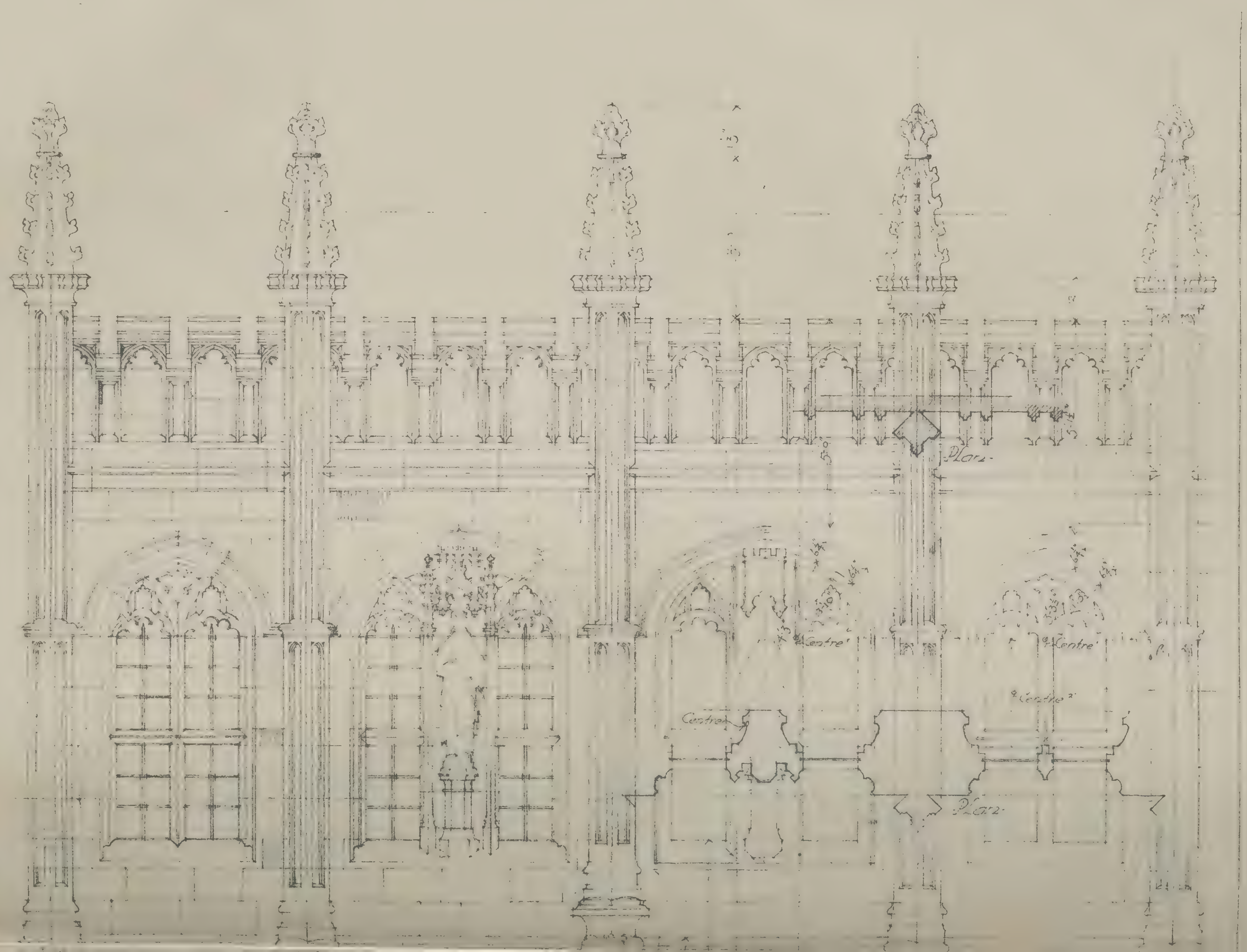
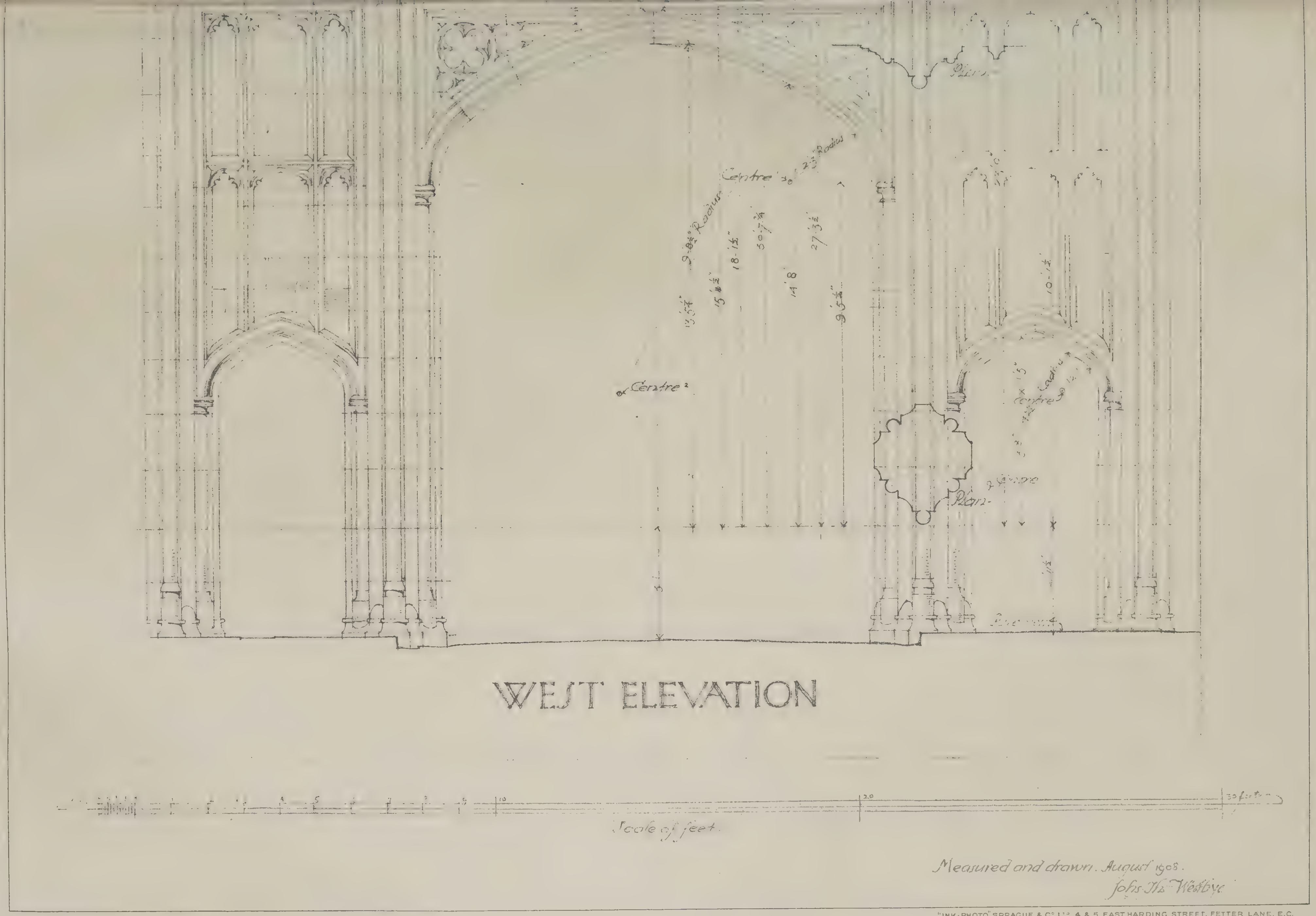
# THE CHAIN GATE AND GALLERY WELLS CATHEDRAL SOMERSET





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THE CHAIN GATEWAY, WELLS CATHEDRAL.

Measured and Drawn by JOHN TH. WESTBYE, Architect.

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# The Architect.

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## FORTHCOMING EVENTS.

*Friday, February* 4.

Architectural Association : Paper on "Renaissance Church Architecture in France during the Sixteenth Century," by Mr. W. H. Ward, A.R.I.B.A.

*Monday, February* 7.

Liverpool Architectural Society : Paper on "Architecture in Ireland," by Mr. F. Batchelor, A.R.H.A., F.R.I.B.A.

*Wednesday, February* 9.

Carpenters' Company : Paper on "Native Craftsmanship in Timber, Brick and Stone before the Eighteenth Century," by Mr. A. Stratton, A.R.I.B.A.

Manchester Society of Architects : Paper on "Town Planning," by Professor S. D. Adshead, F.R.I.B.A.

Royal Sanitary Institute : Paper on "The Ventilation of the Large Examination Hall, Cambridge," by the Rev. J. B. Lock. Followed by a discussion on "The Ventilation and Warming of Public Buildings."

*Thursday, February* 10.

Society of Architects : Paper on "Garden Planning in Relation to the House," by Miss Larrie Dunington.

Carpenters' Company : Paper on "The Pre-Raphaelite Movement in England," by Mr. A. G. Temple, F.S.A.

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## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

WE are pleased to find that the first set of drawings sent in for our new Club are evidently the work of genuine students, and therefore the level of excellence attained is not that of finished draughtsmen, but leaves room for improvement.

In making a pen-and-ink drawing of an architectural subject there are two distinct bases from which a student can start, the diagram and the picture, and one or other of these should be kept in view. Architects' drawings, plans, sections and elevations are essentially diagrams; they do not portray a building as it looks, but as it is, and a perspective drawing in pen and ink can be treated exactly in the same way. The highwater mark of such a method has been reached on several occasions by the perspective drawings in outline of architectural subjects which have been awarded prizes by the Royal Academy to their students. Such drawings are still of the nature of diagrams, and in no way show a building as it looks, but are useful as a study of architecture and show it as it is more clearly though not so literally as a scale drawing.

The pictorial method of delineating architecture may further be subdivided according as the aim of the draughtsman is to show the building as it looks or to make a pretty drawing or picture of which the building is the foundation. In a perspective drawing of a building from the pictorial point of view it is well to remember and adopt the old-time landscape painter's convention of three planes, foreground, middle distance and distance, and to put the building into the middle distance. The composition of light and shade should be carefully studied, and in so doing the student may work either from light to dark or from dark to light. There should be a concentration of interest on some part of the drawing, and not a diffused all-overish kind of effect. Sparkle can be obtained by strong contrast of light and dark, but multiplicity of sparkle should be avoided.

Taking the drawings sent in, not in order of excellence, but as they come, we have first before us Mr. Reginald Pywell's "View of the north-west corner of the Fountain Court, Hampton Court Palace." This is a "diagram" perspective, and, though not in outline, the shadows and shading are so generally uniform that, as a drawing, there is an uncomfortable feeling of flatness, and the perspective is little more than an elevation on a plane diagonal to the walls. In order to realise what the Fountain Court really looks like, one has to bring one's mind's eye into operation just as an architect does when he realises from plan, section and elevation what the effect of a design for a building will be. Mr. Pywell's drawing has taken a great deal of work and labour, and his industry is commendable. In a few minor points the perspective is incorrect, and the reflections in the fountain pool are false, as the ripples from the fountain would extend throughout. The correct drawing of these reflections with the fountain playing is a big undertaking. We award Mr. Pywell a high place, though not the first.

"Esek" sends a drawing of the south aisle of Kirkstall Abbey, which is effectively suggestive and informative to an architect without being laboured or attempting a pictorial treatment. The sense of scale and of distance is very cleverly conveyed, and the drawing is a good example of what an architect's sketch ought to be.

"Derick" is on the way to learn pen-and-ink drawing, but needs to study more thoroughly the question of values and of texture. There is too obvious a falsification of lighting which could not be quite covered by any theory of accidentals. The desire for brilliancy in a drawing should not be allowed to overcome truthfulness. The subject is the entrance of the Fishermen's Hospital, Great Yarmouth.

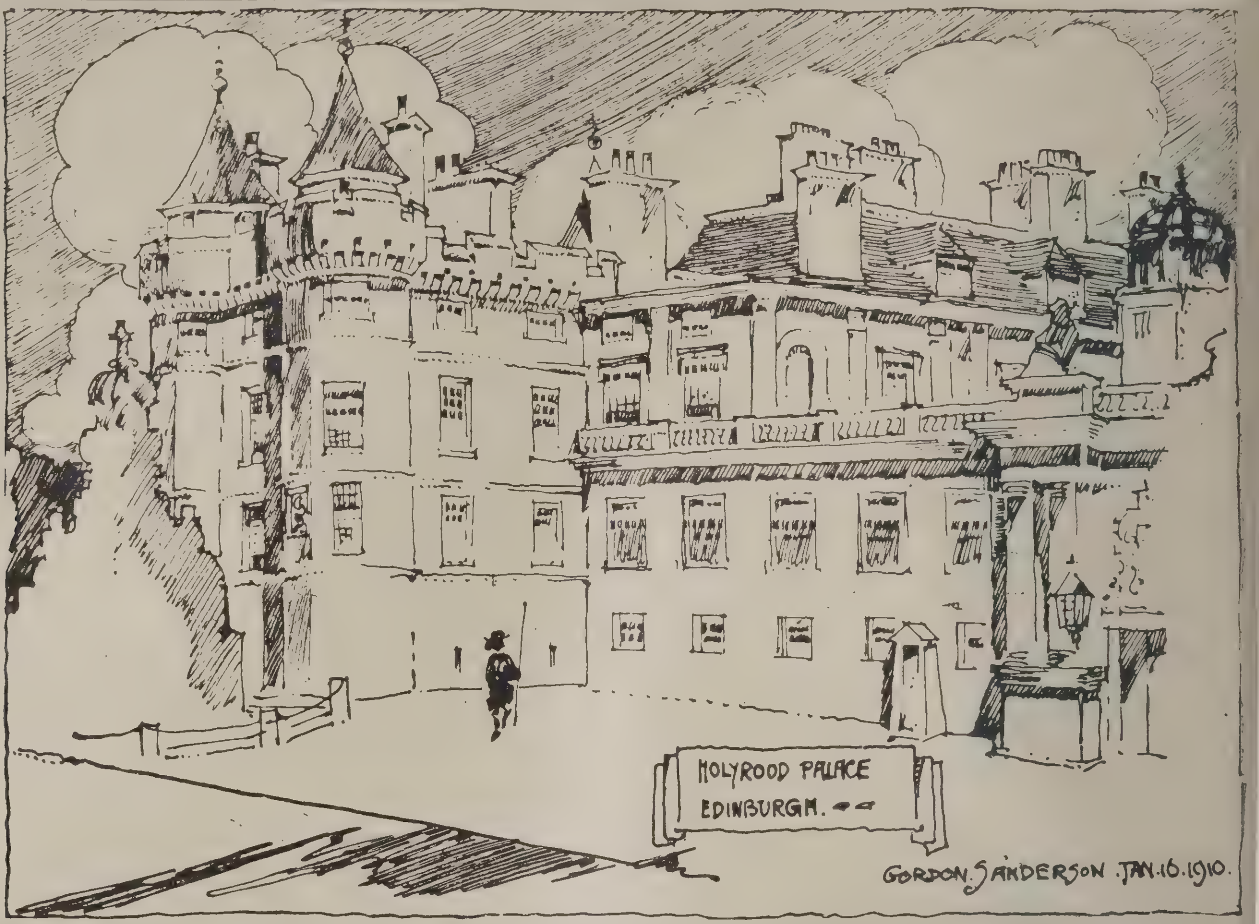
Mr. Percy Bartlett, in his sketch of "A corner of Old Buildings, Lincoln's Inn," has given us an example of the way in which a pretty drawing can be made of a poor subject. The Old Buildings of Lincoln's Inn are interesting as an example of old London, but can scarcely by any stretch of imagination be considered beautiful. Mr. Bartlett's drawing is pretty and effective, the values well expressed.

"Roath" succeeds in conveying a good idea of the architectural design of the old houses at Shepton Mallet, Somerset, which he delineates, but his drawing suffers from a very common fault of young architectural draughtsmen, the falsification of the scale of figures in the foreground. This is a great mistake, as not only does it convey a false idea of the building, but it loses the great advantage of foreground figures or other objects, that of putting the building into the middle distance. There is also too much lack of colour in the shade and shadow by reason of an excess of laborious monotony.

Mr. Adrian Hardman sends an effective sketch of the south porch of the church at Cley-next-the-Sea, Norfolk, which is good in its pen-and-ink treatment, but a little out of drawing in the main arch and the perspective of the buttresses. The effect of middle distance for the main subject is cleverly obtained by a very simple use of foreground objects.

Mr. Frank Suddard, in his drawing of a half-timbered house at Derby, suffers from too much desire for sparkle, the result being all-overish flatness and a lack of atmosphere or distance. The author should study a more pleasing convention for his rendering of tree foliage.

"Sans Peur" is evidently quite a tyro at pen and ink, but everyone must have a beginning. The black



boundary line to his top edges in the drawing of Ryton Church is a mistake, as, generally speaking, a pen-and-ink drawing is better vignetted. Mass lining should be very cautiously used, if at all. The right way to employ it is seen in Mr. Leslie Wilkinson's sketches of Caudebec in our issue of January 7. We hope "Sans Peur" will stick to his motto and pluckily persevere. The subject he has chosen is a difficult one, and something easier would be better for early attempts.

"Sans Peur's" second sketch, the lantern and tower of St. Nicholas Cathedral, Newcastle-on-Tyne, is a subject more within the limit of his present powers, but is utterly ruined by the mass lining. The perspective is also not quite right. The junction of the pinnacle and buttress should not be slurred. It is worth study as a solution of an architectural problem.

"Vamok" is also another tyro, and must learn to walk before he tries to run. It serves no good purpose to splash in ink until a draughtsman has learnt to draw the curve of an arch with fair approximation to truthfulness. The author of this drawing will find it worth while to study carefully the principles of perspective before making further attempts to sketch.

Mr. J. Nelson Meredith has attempted in his drawing of St. Mary's Church, Mold, a subject too difficult for him at present. If the gravestones really reel as he has depicted it would have been better to have suppressed them. Their value as foreground is lost from the thinness of line with which they are delineated. The drawing suffers from flatness, which is emphasised rather than relieved by the black splodges in the belfry windows.

Mr. Meredith's sketch of the church tower is better, because there is less of it; but here again the dead, unrelieved black in the windows spoils and kills everything. The foreground again needs strength.

Mr. Charles T. Whiteley has set himself too severe a task in Magdalen College Tower, and should try a simpler subject next time. He must also give attention to tree drawing, which in pen-and-ink work must adopt a conventional rendering, but at the same time retain some semblance of tree form and structure.

Mr. Harry Collings in his interior of St. Michael' Church, Ravenstone, has a drawing which is too hard i effect, the roof in particular being too mechanical in it drawing. The falsity of the lighting is rather to apparent, although there is a praiseworthy attempt at definite scheme of light and shade. Further study fro actual buildings will be the best corrective for the fault of the author's work at present.

Mr. J. W. Carmichel, Mr. F. D. Browne, and th authors of "Precentor," "Ambo," "Tyke," "Can bus," and "Hotot" may take the advice we have give to "Vamok" as suitable to them also.

We have awarded the prize for January to "Esek, who has been closely run by Mr. Percy Bartlett an Mr. Adrian Hardman.

## NOTES AND COMMENTS.

It is a pity that the annual prize-giving at the Roy Institute on Monday last was less well attended tha usual, for if Mr. Ernest George is not a great orato he at least knows how to give sound advice, pithily e pressed, and every young student of architecture ought t read, mark, learn, and inwardly digest the useful lesso inculcated in the latest presidential address. Of the mar such that we have heard or read in the past, we cann recall one that contains so much sound advice to a your architect compressed into so small a compass as is to b found in that delivered last Monday.

The letter that appeared in our columns last wee from Mr. E. M. Gibbs is worthy of attention from a the numerous architects who take part, either regularly occasionally, in competitions. Mr. Gibbs has in no wa overstated the facts as they stand. Indeed, he has n mentioned some glaring instances in which the cost of th competition drawings to the architectural profession ha at a moderate computation, actually exceeded the sum be expended on the building. While we think Mr. Gibbs proposal is quite feasible, with perhaps the somewh obviously necessary proviso that the assessor should ha power to determine what designs were bona-fide, and therefore deserving of an honorarium, there are other lines on which the present flagrant abuse of the competition system might be amended.

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OUR colleagues in Germany have succeeded, it seems to us, in persuading their public that a far higher scale of premiums should be adopted in competitions, and that far less expensive drawings are necessary to show to competent judges the merits of a design than are the usual custom among ourselves. We think that our assessors are somewhat to blame in respect of the latter point. If an assessor is worth his salt he ought to be able to pick out the most likely design from quite simple sketches. One or two plans on squared paper, to the smallest possible scale, sixteenth at most, and a small perspective sketch should be enough. Then let the author work out his scheme fully, with half-inch detail, at a proper remuneration, for the final approval or disapproval of the assessor.

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SOME little time ago we reported the ancient light case concerning the new Wesleyan Methodist building and the Westminster Hospital, and noted that the Judge referred the case to Mr. JOHN SLATER, B.A., F.R.I.B.A., for report instead of himself deciding between the evidence of expert witnesses on both sides. This week we report the case of SMITH *v.* Anglo-American Oil Company, which concerns a new and important building in course of erection at Queen Anne's Gate. It will be seen from our report that the judge, Mr. Justice JOYCE, instead of hearing any evidence, at once referred the matter to Mr. SLATER for his report. It is evident that the judges of the High Court are becoming tired of listening to the conflicting evidence that is always given by expert witnesses in technical questions and realise the extreme difficulty for a learned lawyer in deciding fairly the usually complicated points and delicate distinctions that necessarily occur in ancient light and other technical matters.

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IT becomes a question, therefore, whether it would not be well for architects to advise their clients to avoid the law courts, and submit such questions always to arbitration. The expense of getting up cases relating to buildings for trial in the High Court is enormous, and if this is to be positively wasted by the matter being referred to an independent expert for report, who thus virtually becomes an arbitrator, it would surely be better to go to the arbitrator direct. There is no doubt that the course adopted by Mr. Justice JOYCE in the present case is more likely to result in a fair decision than if he had relied solely on his own ability to comprehend the merits of the points put forward by both sides.

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PROFESSOR GARSTANG, who is now working in the Soudan, has made some interesting and valuable discoveries on the site of Meroe, the ancient capital of Ethiopia, including the Temple of the Sun, mentioned by DIODORUS as having been founded by ERGAMENES, the inventor of the Meroitic script. The Temple of Ammon has been further excavated and the extent of the building has been found to be greater than was expected. So that altogether Meroe is proving a fruitful field for exploitation.

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THE case of MEASURES BROTHERS, LTD., *v.* MEASURES, decided by Mr. Justice JOYCE, makes clear some principles of law with regard to service that are worth remembering. The plaintiff company is in course of liquidation, and Mr. HERBERT MEASURES, the defendant and a director of the company, having thus been summarily dismissed, it was decided by the learned Judge that he was at liberty to set up in business in competition with the company, but that he was not entitled to make use of lists of the company's customers obtained during his service as a director of the company in order to specially solicit their custom. We understand that this would not prevent Mr. HERBERT MEASURES from circularising all and sundry who might become customers.

## A WEEK END IN EDINBURGH.

"A city that is set on a hill cannot be hid."

THE architecture of Edinburgh has been so often illustrated and described that some sort of apology seems due for its being the subject of this short article, which is intended to show how a student of architecture may, if so inclined, turn a week-end visit to some account, and so carry away with him notes which may be of use to him professionally, and also be a memento of his visit. In the individuality of position of its site as a city, of its old street architecture, Edinburgh stands alone. The old part of the town, the High Street and Canongate and the West Bow, are steep, narrow streets with high houses on either side and "wynds" or "closes" running off them. They were formerly the residences of earls and noblemen, and up these quaint, narrow streets passed the Royal processions to the castle.

Edinburgh was not a town of much consequence till the latter part of the fourteenth century. In 1385 it was styled the Paris of Scotland by a visiting Frenchman. Wood was largely used in the construction of the houses, which were roofed with thatch and consequently easily rebuilt. A French admiral who visited Edinburgh at this time could not get accommodation in the town for his suite, and had to quarter them in neighbouring villages.

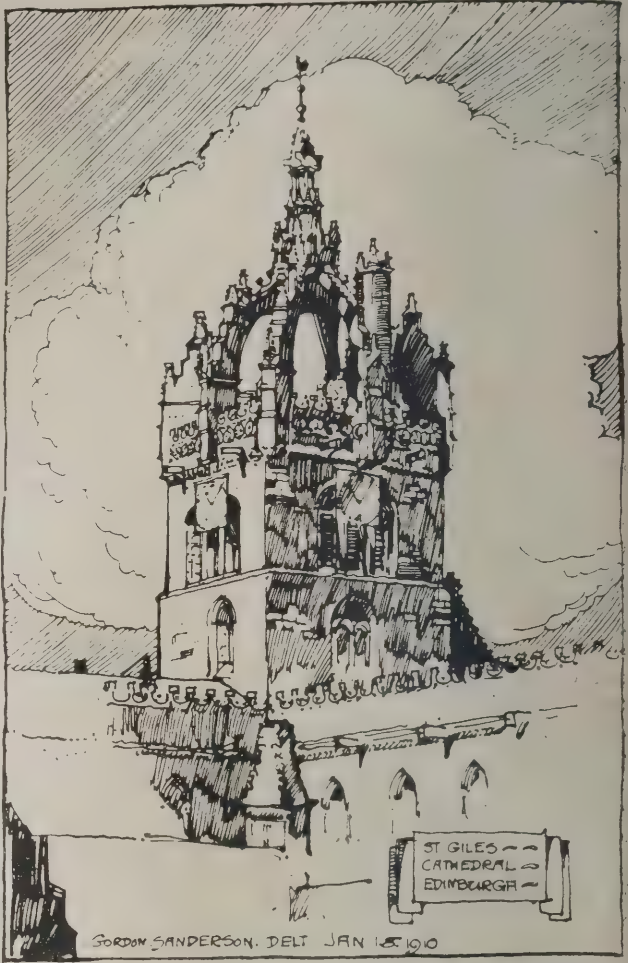
A sketch of the type of house in the thirteenth century is given. Its characteristic features are a strong skeleton of stone with a wooden front 6 or 7 feet in advance, and the outside stone stair projecting into the street, while underneath the projecting balcony there were probably booths and stalls for the display of merchandise.

The next important stage in the development of Edinburgh domestic architecture took place in the middle of the sixteenth century. Wood was still largely used, but construction was better understood and more ornament was lavished on the work. The houses were three or four storeys high, with a common stair, which on the ground floor formed a pig house. The gables were decorated and the houses generally much ornamented. In street pageants or royal processions loyal citizens hung tapestries over the balconies or strung flags across the street, and the general effect must have been most pleasing. A good example of the sixteenth century type of house is shown in the sketch.

In the early seventeenth century wood had given way to stone, and the handsome stone house had attained its highest elegance. Over its shop floor, which presented to the street a neat form of arcade, rose three or four storeys each accommodating some respectable townsman. Access to these was provided by a common stair which was generally a projecting stone turret. The skyline was fantastically broken up by chimney stacks and crow-stepped gables and by roses, thistles or fleurs-de-lis crowning the apices of the roof.

After the reign of CHARLES II., although the boundaries of the city remained the same, the population had very considerably increased. This led to flats being erected, and a twelve-storey tenement was built in 1700. Conveniences of cleanliness and light and water supply were unknown, while the stair acted as a form of "refuse shoot." One can understand that "calling" in those days was no sinecure. Up the stair had to be carried all the water and fuel for the various "flats," and down the same stair had to come all refuse and dirty water, unless these were thrown out of the window into the street below. However, in spite of the lack of all these sanitary conveniences, the owner of every house had a little closet provided, off the dining-room, which served him as a private oratory. It must be admitted that these huge clusters of dwellings set at defiance all laws of sanitation and physical health. The disregard of sanitary laws sobers the æsthetic feeling and spirit of romance which these houses undoubtedly inspire. Still, Edinburgh is beaten on by winds from all quarters, and no doubt they, by their healthy freshness, lessen the evils which these unsanitary dwellings possess.

The cathedral of St. Giles consists of a nave and choir crossed by a transept, while at the sides are chapels and aisles. The four octagonal pillars which support the tower at the transept crossing are supposed to be part of the original Norman church of 1120, founded by Alexander I. of Scotland. The height of the stone roof under the tower was increased in 1400. The various aisles were added between the years 1409 and 1516 A.D. The fine-groined roofs of the church are especially worthy of notice, and the choir contains some very fine foliated capitals. It must be admitted, however, that the tower is the chief feature of the church. Its builders had determined on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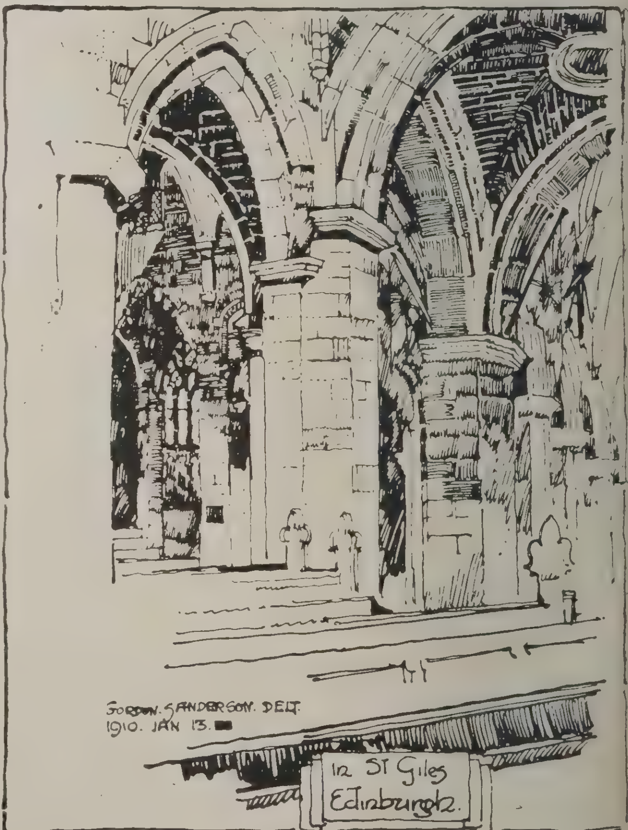
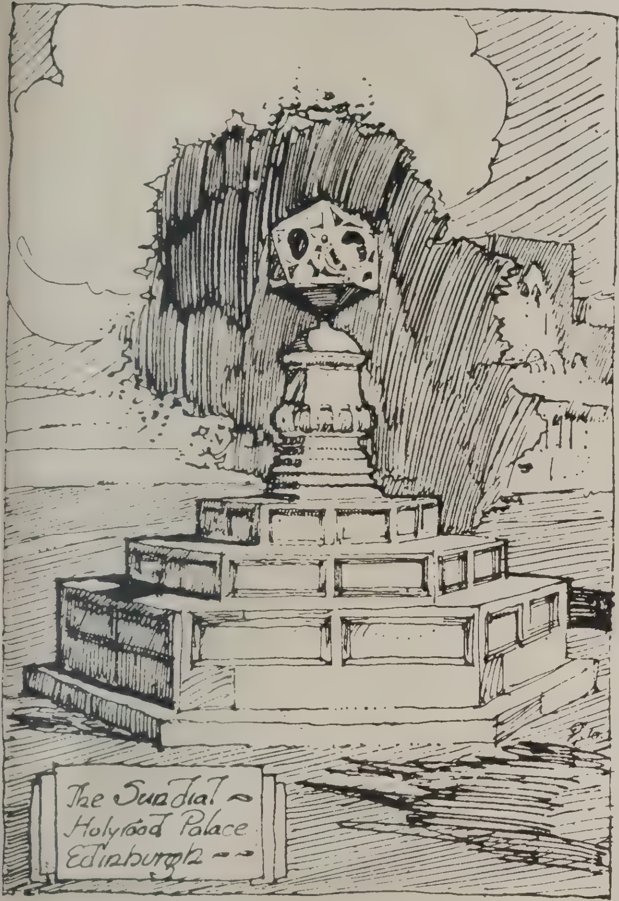
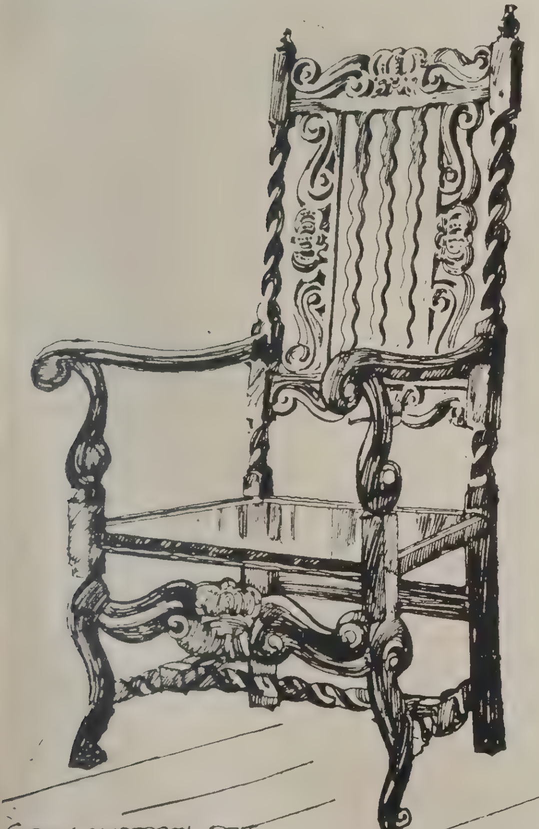

GORDON. SANDERSON. DELT. 1910. JAN 13.
In St Giles Edinburgh.

something new, and imitating the crown of their sovereign in the tower of their cathedral they showed ingenuity and a pleasing imaginative spirit which is perhaps somewhat lacking to-day. This tower was completed in 1495 A.D.



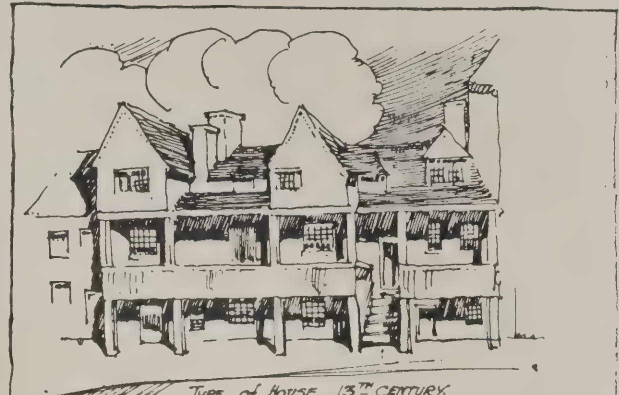
The Sundial Holyrood Palace Edinburgh



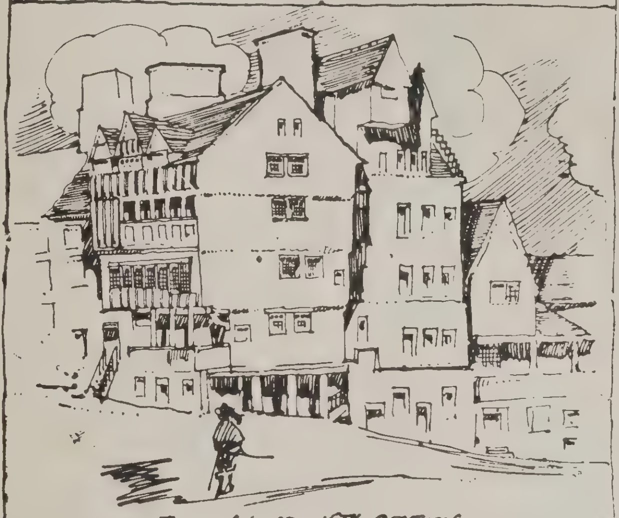
GORDON SANDERSON. DEL.

CHAIR IN HOLYROOD PALACE EDINBURGH

he cathedral has passed through many vicissitudes. urnt by English raiders in 1323, and again by Richard [. of England in 1385 A.D., nevertheless the loyal citi-ens of Edinburgh were not dismayed, but set to work to rebuild it when it was destroyed. It is a noteworthy fact that in it were held the meetings at which the raids into England were planned. At the Reformation it suffered, and its ministers have at various times suffered imprisonment. Restorations have been frequent and not always good. One in 1829 was most unfortunate, but in 1879 a better one took place. A chapel to the Knights of the Thistle is now being added, and bids fair to add yet another charm to Edinburgh's most picturesque building.

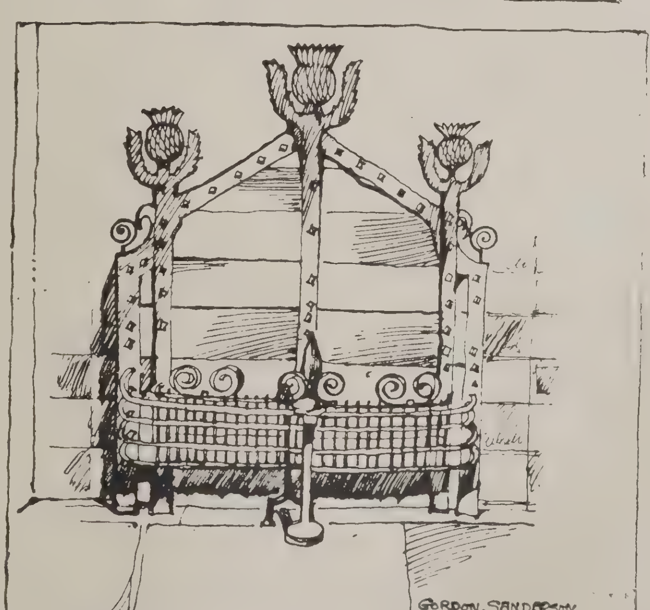


Type of House. 13th Century from an old drawing



Type of House 16th Century. from an old drawing.

GORDON SANDERSON. JAN. 16. 1910.



GORDON SANDERSON.

WROUGHT IRON GRATE. HOLYROOD PALACE

The altered method of access to the city and the absence of Royalty with its necessary appendages have left Holyrood Palace in an inferior part of the present town. The ruined chapel is in sad harmony with the changed surroundings of the palace. However, there is a lingering of tradition cherished by many for this old palace, which is now no longer a royal residence. Built by JAMES V., it was burnt by the English in 1544, and after restoration was the chief court residence of Queen MARY and her son. It was again burnt at the close of the Civil War, but in the reign of CHARLES II. was rebuilt as it now stands.

The sun dial is a very good example of its kind, being raised from the ground by octagonal steps, while the face of steps is ornamented by panels. A well-designed pedestal carries the dial, which has twenty facets.

The Chapel Royal is part of the Abbey founded by DAVID I. in 1128, and still retains some of the Norman architecture. Some of the foliated capitals are very delicately carved, and the vaulting is fine and the whole building well repays a visit.

One of the most striking characteristics of this city is the diversity of its skylines. Ridge after ridge of chimney stacks, with church spires rising from them, gradually lead up to the culminating point, the castle. The architects of the modern work that flanks either side of the South Bridge have thoroughly grasped the general feeling of the city, and have paid the greatest attention to their skylines. Edinburgh is full of interest to the architect and there is no city of the same distinction. The jumble of architectural styles is reduced to a pleasing series of contrasts by the mass of rock on which the castle stands. Like Venice, Edinburgh inspires sentiment. No one can visit the city without being impressed by it, and for the architect there is a boundless field for study.

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## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening last at Conduit Street, W., Mr. Ernest George, A.R.A. (President), in the chair.

Mr. H. T. HARE (Hon. Secretary) announced the decease of Benjamin Tabberer, who was elected Fellow in 1882. Mr. Tabberer was district surveyor for East Deptford and Greenwich, and had served on the Board of Examiners and on the science standing committee of the Institute. It was agreed that a letter of condolence should be sent to the relatives of the deceased member.

### Royal Gold Medallist.

The PRESIDENT announced that Mr. T. G. Jackson, R.A., had been nominated by the Council, subject to the approval of His Majesty the King, as the recipient for the Royal Gold Medal.

### President's Address to Students.

He said:—By established custom I address the junior members of our craft, those who have the inestimable gift of youth, and who will be filling the seats of their elders, I trust with benefit to the community.

Last year I gave my own experiences and expressed such views as I had arrived at, experience often showing what not to do again. Yet if we in life could be allowed a second innings, probably we might not do more wisely. It is the common lot to work, and it is a matter of the first importance that your work should be that which interests you. Instinct and inclination may be taken as guides in your general direction.

I trust you have chosen the study of architecture because it is attractive to you. It would be dull work for you, and the results would be deadly dull, if you took to the artist's career as you would to brewing or baking, with the humble aim of making an income. The latter is rather illusory and unsubstantial, and when it comes is the result of much hard work in which the artist finds his pleasure, but which would be drudgery to the unillumined soul.

I assume, then, that you are each conscious of the divine fire; it remains with you to see that it burns clear. To this end earnest application is necessary, and a thorough education both in science and art as well as in wider fields of knowledge. You will be called upon to make sacrifices and to relinquish some of the amusements and harmless frivolities of youth if you are faithful to your art; your pleasure must be in serving that exacting mistress.

Architecture is associated with every condition of man, and it should find appropriate use either for the temple or the tavern. The problems that will come before you are endless, giving constant variety to the work. There will be no time for idling. A painter may desist from his work awaiting inspiration; the architect, when grounded for lack of matter, may turn from composition to the many practical details that his occupation demands. He must recognise that he is a man of business, with grave responsibilities to his client; he must not pose as the brilliant genius, above mundane affairs. He must cultivate methodical habits and exactness.

In the schools or in the office you will find young men sharing your pursuits and aims; and among them may be good companions and friends. Seek the society of fellow artists of all kinds; be they painters, sculptors, or craftsmen, it will be a mutual advantage. You will still have time to spare for the outer world, where you must not be unseen or unknown: it is there you find the client who gives you the chance of beautifying the world. Cultivate tact in the treatment of the client when you get him; consider things from his point of view, his doubts and anxieties, financial and other, when starting on an important building enterprise. You probably know better than he does what he wants or what he ought to want; do not vaunt that knowledge, but let your scheme seem to emanate from him. The plain man may tell you he "knows what he likes," and he possibly likes what is abominable; do not tell him so he will be converted by degrees to like what is good. You cannot have all your own way, and your pet schemes may often be frustrated. After all, it is not your house that you build, though you are allowed the fun of shaping it. I have spoken of the natural man, the untutored, but I mus acknowledge having worked for those whose refined taste and judgment have been an unqualified advantage to th architect and to the building.

Education and cultivation of the mind should be alway going on. Read much, and think much, and primaril make careful study of noble buildings; see why they impres you; measure, plot, and sketch them. Cultivate observation and memory, so that these fine things remain with you they will influence your work for good when you think to b drawing upon your inner consciousness.

The things that Solomon knew are nothing to the catalogue of details that you are expected to grasp. It behove you to know the history of architecture and to follow through its many phases. It is well to be familiar with th literature of our art—the splendid books that have been produced in past times and in various languages. It is muc to your advantage to have the command of foreign tongue

Indeed there is no branch of culture that is not a valuable asset in shaping the accomplished architect. I trust that you are gaining all the time a knowledge of construction, the paramount essential in the curriculum. Use every opportunity of visiting works in progress, builders' workshops and masons' yards; if also your hand can acquire some skill in any of the trades, it is all for your good. The limits of time and the shortness of life must be taken into account in making choice of subjects to be mastered.

While holding that for a modern-day architect this large mental equipment is desired, it is fair to remind you that good work has been done without it. A fortnight ago we had from Mr. Kitson an interesting paper upon an architect who built many of the eighteenth-century mansions of Yorkshire. He was the son and the grandson of a mason, and was perhaps the last of the old order of men who accomplished their work with only the master-mason's traditions. Such a man was not disturbed by a knowledge of all the styles, nor by familiarity with all the building materials at our disposal; nor did the science of heating, lighting and sanitation complicate his problem. Incidentally, it was mentioned that this provincial architect left 160,000*l.*; but that is a minor detail in the career of our artist. I can conceive that from such a man and under such conditions a quiet breadth of treatment would come naturally. The man of higher attainment and with knowledge of our many inventions would be under more disturbing influences.

Yet I think we all accept the fact that sound training is necessary. First and foremost, acquire the art of drawing; it is the language in which your ideas must be told. Whether you are to be an architect or a landscape painter, drawing is best learned by the study of the figure from life or from the cast; it is the best training for the eye, demanding accuracy and judgment. The hand and the mind should learn to work together, evolving schemes or forms, and feeling for that which is best.

Avoiding all tricks, acquire a pleasant manner of drawing, one that makes your building presentable; for I have seen fair composition so expressed as to look forbidding—perhaps with capitals, mouldings and carving put in with a heavy hand, such detail making dark splotches of those parts which would be the high lights of the building.

But drawing has generally received its full meed of attention, and the greater danger is of regarding it as an end instead of a means. We have known such facility acquired that the hand has moved in advance of the mind—a fluency that speaks before thinking what is best to say. There is also drawing so pretty in its technique as to give fictitious attraction to a bad design.

The prizes we have the pleasure of giving to-night are for studies and compositions in some of which the drawing is, in my opinion, nearly as good as possible. My friend Mr. Macartney will be critically reviewing this work presently, and his discriminating judgment will probably find some faults. We have on the walls of this room the recent works of last year's prizemen, and I think you will agree that the fine colour-scheme of Puvis de Chavannes is beautifully rendered by the drawings of Mr. Martin. The admirable drawings by Mr. Drysdale and Mr. Miller speak for themselves.

Archæology will enter into your historical studies, but let it not be a matter of dry bones with you; do not follow it too far, troubling yourself with curious or unprofitable speculations; do not become the pedant. You should be conversant with the great achievements of all periods, yet I think the mind should be occupied with one method of building, of construction, and of treatment at a time. While examining the refinements and subtleties of Greek art and following on through the works of the great Roman builders, it would be undesirable to distract the mind with the study of the Gothic shrines, the soaring towers and spires of the North; they have their origin in another inspiration, another conception of the beautiful. There is the glory of dazzling light in the one case, while solemnity and mystery are the aim of the dim vaulted aisles of the mediæval sanctuary.

With all the striving after originality, I hope the rising architect will retain a reverence for tradition. His best education is in the study of the fine work that his forerunners have done. As a change and recreation he has also the study of Nature, her laws, her methods, and her marvellous arrangements of colour. He must not, however, transplant the actual forms of verdure, chiselling them in stone, or using the fronds of ferns for metal castings.

Proportion is perhaps the most essential element of good architecture. It costs nothing, and it is applicable to the humblest as well as to the noblest of works. How is it to be secured? It is the product of the trained mind and the practised eye. True, it has been reduced to a science, and there are lines laid down, with mathematical rules to be observed—rules that can be applied to the just proportion of length to breadth and height.

But the beauty of proportion comes in with every detail: with doors, windows, and their appropriate mouldings; and I think it can only be secured by a refinement of knowledge and taste—the subtlety of feeling that is indispensable to the production of fine music or painting. It is in a measure intuitive to the artist, but it is also a faculty for cultivation, and perhaps is gained most by the mental assimilation of great work.

Texture, though secondary to proportion or shape, greatly affects the building; indeed, proportion is upset by over-large mouldings, keystones, or by sculpture in the wrong place or to a wrong scale. The touches that should be the crowning glory of a work may, by ignorance, be made subversive to beauty. I must be forgiven for putting sculpture under the head of texture to the building, but as such it must be taken into account.

The sizes and jointing of stone courses are a factor in the matter of scale. We know the charm of small bricks as seen in the Flemish buildings, and we admire the long thin brick in the Roman walls, while none can fail to be impressed by cyclopean stones as seen in the temple or in the bastions and walls that girdle an Etruscan city.

Smooth walls of ashlar stone or of gauged brickwork seem right with Classic work and its delicate mouldings; while rough brickwork is in vogue for buildings of other types, some of our friends specifying that no mortar joint shall measure less than half an inch. The broken colour so obtained is pleasant, but the beauty of your work must not depend mainly on the accidents of texture and colour.

What may be said of colour? It has an influence that appeals to us directly, for our happiness or distress; light and darkness are in its train. As a nation we are not colourists, and we have been shy of colour since the primitive Briton discontinued woad as a costume. Within the house there is the fear of losing light, while out of doors the feeling is that in our London streets all will presently be of the same low tone. There have been daring experiments with glazed materials, some with distinct success, but a shiny surface is not generally acceptable.

If for our street fronts we could be offered the frescoes of the Verona market-place, I am not sure that they would be cheerfully accepted, and if we should have them in their pristine condition I am sure we should consider them crude and garish. Our taste is for the old masters, old tapestry or stuffs, when colours have been lowered by the passing of three hundred years. Perhaps it needs a sunnier clime than ours to appreciate real colour.

As a broad principle I think that raised surfaces and colour are seldom wanted together. A coffered ceiling or a good piece of modelling with its projections well considered does not want its background picked out with colour—its light and shade are an equivalent to colour; also a fine painted or mosaic ceiling is best as a flat or curved surface, or with only the slight projections of gesso.

We know that the Parthenon and other inimitable Greek monuments were originally in colour, the mouldings picked out, while the marble gods and goddesses were tinted in flesh tones with coloured draperies. To me it seems that breadth would be exchanged for realism, the Greek masterpieces sharing the quality of waxwork; but I dare not question what was done by the consummate artists of the great age.

In mediæval times the Gothic churches and castles had their shafts, ribs, and mouldings in positive colours; the devices of heraldry supplying the *motif* of decoration, and the scheme, though vivid and crude, must have been splendid. The full glory of colour is found in fine stained glass, and that is at its best when throwing its tints on uncoloured walls. Walls of precious material or rich in decoration are best under the unobscured light of day.

In the study of colour make careful notes of such good combinations as you find either in man's work or in Nature, especially noting the quantities in which they are used. The blue cornflower is gem-like when dotted in a field of golden corn, but it has an altered value in larger mass, as when covering the human frame. As a reaction from varied and disturbing colours, the simplicity of whitewash has been found refreshing; in broad light or in reflected light it is altogether beautiful. Brown paper was discovered as a pleasant and retiring background, and I am told of a house that a young enthusiast papered thus from attic to basement. Another instance I call to mind of a room painted black; but I do not feel that a resort to brown paper, to black, or to whitewash is solving the subtle problem of colour.

I will not talk to you of styles, to advocate one or to disparage another; we have ceased to fight on that field. I will only say that the qualities making for good or bad are, in all styles, the same—viz., truth of construction, justness of proportion, breadth and simplicity, and, above all, simplicity. All the tawdry vulgarities that shock you are the violation of that quality; efforts after the pretentious or pompous; the assumption of something that is not. A building may be rich and yet broad in treatment; our Houses of Parliament may be taken as an example. The fascinating devices of Pugin give richness and texture to the whole surface, but they are so employed that the broad masses of Sir Charles Barry's composition only gain thereby. In contrast to this, the Horse Guards, Whitehall, is a building severely plain, hardly a moulding to arches or openings, yet it gives almost an impression of richness by the proportion and disposition of the parts and the skill in arrangement of its lights and shadows. Misplaced ornament is the bane of architecture, as is also ornament that is out of scale.

We have touched upon the many things that it is good for you to know and to do; though you may be an Admirable Crichton, you will not accomplish all. You must make choice of that which comes best to you and for which you have affinity. In some cases combination meets the many requirements of the architect, who must play the parts of artist and man of business. If any two of you, quite sure of one another, agree thus to divide the work, it may be for your mutual happiness. The work will be done with fewer disturbing interruptions, and you will have companionship to lighten the worries that must arrive from time to time.

I have said study simplicity in design; I would further urge simplicity of life. Let your wants and your encumbrances be few, that you may be free in the race. Concentration of mind and of aim is essential if you are to be successful. I mean real success, which is not always to be measured by income. Comfort, cushioned ease, and expensive cigars are not a stimulus to the artist; discipline he needs, and the best form is self-discipline.

The Duke of Wellington said that Waterloo was won in the cricket field—and manly sport has had a fine influence on our race; but sport has become with us a fetish to be worshipped. Sir William Richmond has been bold enough to say that "games will be the ruin of England"; Rudyard Kipling created a shock when he spoke of "flannelled fools"; and we must admit that the devotee of art can hardly be prominent as an athlete; he starts with a different temperament, moreover he cannot spare the time to become distinguished in various sports, although we have among us one or two brilliant exceptions to my theory. To you the sketching on Saturdays is more important than the following of games, and your life will take different lines from that of the man of leisure or of commerce.

I have before expressed my belief that it is well you should have to live by your art. It is good for you personally, and I think it is also good for the work. An architect has no opportunity of producing pot-boilers even when money is scarce. I do not know how many of you have been born with the traditional silver spoon in the mouth—I do not specially congratulate those who have. You have the harder fight against the spirit of indolence that is in us all. There is also the temptation to use the brains of others if you have them at command, to become mere dilettante or, saddest, to become the art critic instead of the art worker.

When sufficient knowledge and discrimination for the purpose have been attained by the student, foreign travel comes to him as an inspiration. With delight he will see in substance the monuments that have been familiar to him only in diagrams and text-books. There is joy in the freedom of life, and fascination in the change of scene, of climate, and of human interest. With these pleasant distractions discipline and application are specially called upon for the gathering of that which is precious and the refusal of all that is ephemeral or meretricious though attractive.

It is our desire that those who go out with our travelling scholarships should accept the task of making a thorough and exhaustive study of one or more notable buildings, the intimate knowledge of which will be a lasting influence. There is the further interest that the best of such work will be published in some permanent form, making a contribution to our architectural records.

For those who are not privileged to make the grand tour there are priceless treasures to be found in our museums; doorways, fountains, monuments and bronzes of the great periods, and those now seen judiciously placed and well lighted in their spacious new home, accessible to all, and giving the student a quieter time for measuring and drawing than the traveller would obtain in a continental street. These objects demonstrate the treatment and workmanship of the artist and craftsman, but much of their meaning is lost when these features are divorced from their natural surroundings. The student must look at things as a whole, noting the important element of scale; he must not be absorbed by details.

I have spoken of foreign travel with its advantages and pleasures, but how much we have close at hand that is an education—with Hampton Court on one side of the town, Greenwich Hospital on the other, our City itself with its domed centre, its many churches, Chelsea Hospital and Somerset House, to say nothing of modern work, some of which I hope reaches a high standard and is worth your consideration.

I will not define how far sketching, painting, or etching may occupy your time with the many pursuits that are necessary; they form a happy recreation, a change of vision, and are restful while training the hand, the eye, and the mind. If facility is attained such work may become too attractive, taking the place of the more plodding and painstaking duties that claim your attention.

Our technical schools, State or rate aided, have been turning out batches of young men partially equipped for doing your work, and they will be provided from the public funds with drawing boards and T-squares for the purpose. Till they get outside the schools they do not learn, poor fellows, that the field is overcrowded and that we have no use for them; there is at the same time a great lack of good mechanics, a deficiency which they ought to supply.

There is an effort among ourselves to raise the standard, both social and educational, of the practitioner, believing that thereby the quality of work will be raised. It will be only by the use of your higher endowments that you will keep the field. Our "art" teaching has been fraught with curious results, and I fear we have many bad artists who might have been fine craftsmen.

It is worth much to you to acquire literary style, your letters and reports being terse and clear of verbiage. The art of public speaking should be part of your equipment; you may take the advice as sound from one who lacks it. It will always be pleasant in this room to hear the voice of any young man who will add to the interest of the subject considered; he may often contribute profitably to the discussions. I speak of debating, not of bear-baiting. We have instances, fortunately rare, of young persons seeking prominence by the latter process; perhaps giving notice to "ask questions"—a string of them, pertinent or impertinent. Of all things avoid professional politics and cabals. They disturb that tranquillity which is essential to the performance of good work, while they occupy time that should be given to the claims of art.

In this Institute, our Brotherhood, our aim must be to help one another. We do not all meet with equal fortune, and if success comes to you give a helping hand to your fellow who has less luck in the lottery. Fortune is a fickle dame, and none can tell which of you now entering the arena is to be the great architect of the future. The ranks are well filled, I will not say overcrowded, but for those of you who use your opportunities aright, who train seriously and possess your own souls, there will be work for your hands to do.

We are in the habit of judging the standard of architecture by the public or prominent buildings of the year, and by such pretty pictures as appear in the professional journals. It is painful, however, to remember that these are a very small portion of the building that is done in the country, the mass of which knows no architect and is subject to no laws. In the future we trust that the speculating builder, and the hard-headed lawyer who finds him the money, will realise the advantage of the architect's help to improve his plan, to give pleasant proportion to his building, and a semblance to some recognised style, while saving him his present outlay on lavish and misplaced ornament.

There is with us the beginning of an appreciation of architecture. There is the idea, comparatively new to us, called town planning; the knowledge that we must work not only on our own plot, but consider also our neighbour, combining with him for a pleasant lay-out, a monumental disposition and grouping of buildings.

I verily believe, in the period that you enter upon, architecture will rise to a higher level than it has known in our day. I earnestly hope to achieve that end is the steadfast aim of you architects of the future. I wish you good luck, and a large store of happiness to be found in the work which it will be your privilege to do.

*(To be concluded.)*

# ILLUSTRATIONS.

### CATHEDRAL SERIES, LLANDAFF.—FROM THE SOUTH-EAST.

HIS view of the cathedral from the south-east is in continuation of the series of photographs from landaff which have been taken by Mr. JAMES BORLAND, amateur member of our staff.

### THE CHAIN GATEWAY, WELLS CATHEDRAL.

E now give a section through this building, by Mr. WESTBYE.

### SKETCHES BY BANISTER F. FLETCHER, F.R.I.B.A.

HESE were prepared from Mr. FLETCHER's sketch-books in illustration of his lecture at Carpenters' all, a full report of which we give on p. 81.

## THE CARPENTER'S CRAFT.*

### *Introduction.*

HE carpenter comes to us as an almost heroic figure out of the dim dawn of the world's history.

From the earliest ages until the present day, when every hoolboy loves to whittle a stick, working in wood has ercised an extraordinary fascination over mankind. Wood, th strong and pliable, was naturally the material most sily adapted to the service of man. Its very growth with its pward spring and its arching boughs has suggested the anner of its employment, and its influence on the architecre of all centuries and all civilisations can easily be traced. has been used for bridges, it has stood as posts in half-mber houses, and as beams it has borne aloft the roofs of udal halls, tithe barns and churches. It has been sunk as les on which were reared those glorious palaces of Venice, d it has also been worked into their rich and glowing ilings.

The German mediæval artificers wrought it into cunning vices, and our own Grinling Gibbons swung it into garlands living fruit and flowers. It has also been hollowed into noes, has determined the shape of ships, and suggested the ising of their masts. It has been scooped out as water conits, and thus laid underground has formed drains even for is city. It has been fashioned into wagons and played its rt alike in the chariots of ancient races and in the coach the Lord Mayor's show.

Everywhere and at all times, whether as ships, coaches or idges, wood as a material has been a great medium for man intercourse. Further, it was cut into blocks for the st printed books, and thus gave an impetus to learning and rew open to all the doors of knowledge. This then is how e carpenter acquired his craft, which, however, has been bject to the same laws of specialisation as other arts and afts: thus we find the carpenter, the joiner and the carver l fellow-workers in the same useful material. There is no finite record of the beginning of joinery, but in "A Midmmer Night's Dream," Shakespeare makes Quince the carnter and Snug the joiner quite naturally, and as a matter course, as distinct from one another as any trades union ws or economic division of labour could make them in our y.

The joiner's art first appears in the thrones, pulpits, stalls d screens of our cathedrals and churches, but it is there lied with the art of the carver. Suffice it to say that the rpenter's craft was at the beginning of things, and we shall w pass it in pictorial review, bearing in mind that this is e pioneer craft from which in later times sprang those of the iner and wood carver.

The influence of carpentry on architectural forms has deed been great, for from the simple hut the Doric order s derived, with its well-known entablature, in which the glyphs represent the ends of wooden beams, the mutules dicate the rafter ends, and the sloping roof gives the outline the pediment. Thus were evolved those wonderful marble mples of the Greeks which have exercised such great influence on all subsequent lithic art. Although all wooden structures of this early period have long since disappeared, yet in out of the way districts of the world simple timber dwellings are still constructed, as in the hut at Uganda near Lake Victoria Nyanza. This hut which is seen in process of construction with a framework of twigs covered with rushes to form a shelter against the elements, gives a good idea of one type of prehistoric building, and therefore has a passing interest for us, as showing how under primitive conditions carpentry forms are similar.

Other quaint and interesting specimens of the craft are frequently met with, and in the Bosphorus some years ago I saw a unique dwelling which was occupied by some of the sturdy Turks who gain their living in a precarious way among the small villages on the banks. Here supported upon long poles sunk deep in the bed of the sea is a little dwelling reached by a ladder, while at one end of the structure there is a framework from which the fisherman can ply his craft.

The time at my disposal, however, compels me at once to proceed with the craft as we know it, and to keep almost exclusively to work in this country, dividing my subject broadly into external and internal craftsmanship and furniture.

### *External Carpentry.*

*Half-Timber Country Examples.*—The craft of the carpenter in its simplest aspect is seen in many a country cottage, of which the oldest type is probably that which still exists near Winchcombe (Gloucestershire), where bent trees called "crucks" were set in the ground and meet at their apex in the ridge piece. These crucks are strengthened by cross braces secured by wooden pegs, and are placed about 16 feet apart, each forming an architectural unit or "bay."

In these early homes there was no upper storey and the walls were either made of "wattle and daub" filled in between the timber framing, or of planking nailed to the "crucks." The side walls of this house are later in date, as is of course the paltry looking entrance porch.

Anne Hathaway's cottage at Shottery is a world famous example of the carpenter's craft, in which post, rail, and brace are the structural parts, while the brickwork merely forms a filling between the timbers.

This type of construction is frequently found in old cottages, and eventually, as will be seen, led to very elaborate examples of what is known as "half-timber work."

Grimshaw Hall is an illustration in which the lower part of the walls are entirely of timber studding, while the upper part is of brickwork between timbers pinned together with stout oak pegs. The gable itself projects on a beam supported by timber brackets, while interest is given to the façade by the projecting central latticed oriel.

A still more elaborate and very beautiful example is Ockwells Manor, Berkshire, where the system is applied to a large house framed up of stout oak posts and rails, between which the brickwork, in herring-bone pattern gives colour and contrast. The porch with its battlemented beam and richly ornamented barge-boards is a striking piece of mediæval carpentry.

Adlington Hall, Cheshire, is a half-timber building in a district where forests were plentiful, and it is only natural that the carpenter's craft should have had its fullest scope in such localities where wood was the most easily available material. The walls are honestly designed in timber, the projecting upper floor on the right wing being connected with the lower by curved braces, while variety and strength are given by the inclined struts between the posts. The plaster filling between the timbers makes a good contrast with the black tarring used as a preservative.

The courtyard of Little Moreton Hall, Cheshire, shows a further development in which the coving under the window sills is formed in squares, with the crosses of St. Andrew and St. George in plaster, while the doorway is emphasised with a double row of quatrefoils between uprights carved as pillars. The gables too have quatrefoil fillings, the whiteness of which contrasts effectively with the deep shadows thrown by the projecting barge-boards.

Agecroft Hall, Lancashire, is a beautiful example in which the timbers over the doorway are closer together and formed into bold quatrefoils. Here as in many other buildings is seen the genuine timber character produced by frankly exposing the oak pins or pegs which hold the framing together, and thereby giving that vitality of expression which should be aimed at in all honest craftsmanship.

The gables of some of the half-timber houses as at Ruthall (near Ross), Herefordshire, have rich yet bold carving which should be within the scope of a competent carpenter. The barge-board with its series of repeating arches and foiled cusps, the fine carved pendant at the apex, and the battlemented tiebeam with the Prince of Wales's feathers in the centre, all add to the rich character of this interesting house.

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* A lecture delivered at Carpenters' Hall on January 25 by . Banister F. Fletcher, F.R.I.B.A.

The "Old American Colonial" architecture of the early eighteenth century and onwards provides many examples such as Hurd House, Charlestown, Massachusetts, in which timber from the surrounding primæval forests was utilised, and into which was translated the homely architecture of Queen Anne and the early Georges. Such houses are thoroughly suited to the material, and were built by carpenters. In the colonnades and entrance porticos the orders of architecture are made of slighter proportions suited to wood instead of stone. They form some of the most charming details of this timber architecture, and mark a return of the "Orders" to their original material. It is possible that with more enlightened building laws and the use of non-flammable paint, houses of timber, which is a non-conductor, may again come into vogue, resulting in buildings which are comparatively warm in winter and cool in summer. It is not only in country districts, however, but also in towns that beautiful building examples of the carpenter's craft are to be found.

*Half-Timber Town Examples.*—The Rectory at Winchester is a simple and sturdy structure, in which the massive beams of the first floor project boldly and throw a deep shadow, while the upper part is framed up with widely spaced posts, beams, and curved braces, between which is plastered brickwork. The march of progress has caused a large number of the smaller wooden houses to be destroyed in England, but many examples still fortunately remain, both here and on the Continent, as an evidence that timber was much used in town buildings during the mediæval period.

The fifteenth century wooden house at Ypres in Belgium is entirely framed of timber, faced with vertical oak boarding, which has taken some beautiful weather stained hues. Variety is here given to the upper part by forming the gable as a pointed arch, underneath which a trefoil design gives interest to an otherwise plain treatment.

The old houses in Lisieux have the upper storey, which forms the dwelling, overhanging the lower. This method was often employed in the narrow streets of mediæval towns to increase the size of the upper rooms, and it also incidentally protected the passer-by from garbage thrown from the upper windows. The timbers are well strutted and have plaster filling, while coupled brackets support a pointed arch, which gives shadow and prominence to the overhanging gable.

London, although so greatly modernised, still possesses in Staple Inn, Holborn, a beautiful example of the craft, dating from about 1600, and giving a good idea of the buildings of that period. The projecting storeys one above the other, the oriel windows under the storey beams, and the long undulating horizontal lines of the timbers form a composition most charming in its simplicity and unity of treatment, and show how well this example of English craftsmanship, having escaped the devastating Great Fire, has stood for over 300 years.

Smaller and more elaborate is the house originally erected by Sir Paul Pindar in Bishopsgate Street. The upper part shows the variety of treatment obtainable by the projection of the floors and by the formation of a splayed bay and circular oriel in each storey carrying up the central line of the front. The house is fortunately still preserved in the Victoria and Albert Museum.

The Feathers Inn, Ludlow, built in the early part of the seventeenth century, is one of the numerous inns where good cheer was dispensed in the days that are gone. Considerable richness has been given to the façade, the two upper storeys having posts and beams ornamented with quatrefoils, while the gables above have elaborate barge-boards with finial and arched ornamentation beneath. The lower part of the building has unfortunately been painted to imitate the timber work.

Leicester's Hospital, Warwick, is an evidence of the philanthropy of the Middle Ages, and owes a good deal of its picturesqueness to its quaint position above the roadway which passes under the church. The upper storey in this case projects considerably and rests on the beams of the lower storey, interest being imparted by the varied use of timbers both vertical and in a herring-bone pattern.

Ford's Hospital, Coventry, is more pretentious, and appears to have been erected before A.D. 1517, as a will of that date exists giving property to the hospital.

The posts to the upper and lower storeys are carved with buttresses and pinnacles, which show clearly the influence of the architecture of the time. The upper part is chiefly remarkable for the three projecting oriels, the filigree work at the top of the windows, the richly carved barge-boards and the moulded finials.

The internal courtyard has that reposeful character which
good, honest work generally imparts. The long lines of
window lights on the ground floor are shaded by the projecting upper storeys, so arranged in order to give large
rooms. The upright timbers, quaintly fronted with smal
buttresses and pinnacles, and the gable at the end of th
court, are similar in treatment to those on the street façade.
What can be more delightful and tranquillising than this
haunt of ancient peace in the midst of the great motor industry of to-day?

Chartres possesses an old house, part of which has
spiral staircase designed as an external feature, and it is
very beautiful example of the use of spiral forms in archi
tecture. The raking beams show the line of the steps and th
main posts are terminated in pendants so as not to interfer
with people using the entrance doorway. The intermediat
ornamented studs are connected with arches roughly forme
and those on the upper storey have carved figures supportin
a bold projecting cornice.

The detail of the lower part shows very clearly the fram
ing up and pegging together of this genuine piece of car
pentry, patched here and there as occasion has demanded t
arrest decay. From the consideration of these timbe
houses as a whole, we pass to some characteristic featur
which lend themselves in a special manner to the craft of th
carpenter.

*Turrets.*—Heveringham Hall, Suffolk, has an eighteent
century roof turret over the stable entrance whic
is designed in accordance with the architecture of the perio
The wooden posts supported by the main roof have capita
over which is a cornice and ogee-shaped roof covered wit
copper now of a varied and beautiful green.

Guildford Town Hall has a fine hexagonal turret whic
sits boldly on the roof. The turned balustrading and corni
are all in keeping with the wooden entablature and pedime
of the main structure below, which is a typical example
the Georgian era. The clock projects boldly from the gab
so as to be visible up and down the High Street, and t
clock-case in itself is a beautiful piece of decorati
carpentry.

*Porches.*—The entrance porchway at Agecroft Hall, Lanc
shire, is a simple treatment for a porch, although later e
amples were of a richer character. It is recessed behind t
main wall; the side posts are strengthened with broad baul
of oak, resting on a stone base, to protect them from dam
and some character is imparted by the insertion of a spandr
piece pegged to the posts and beam. At the apex of the openi
is a carved shield, above which a rounded shaft with mould
capital supports a little oriel window, the underside of whi
is vigorously carved with simple tracery.

The entrance porchway to Little Moreton Hall, Cheshi
is reached from the bridge over the moat, and is a rich
carved example, suitable to a nobleman's mansion.
either side is seen some of the "black and white" timb
framing, and beyond, on the other side of the courtyard, o
of the bay windows which light the old hall.

Huddington Church has a projecting porch, and t
weather-beaten piece of carpentry, although devoid of orn
ment, is perhaps for that reason all the more effective. T
posts are housed into longitudinal sills resting on rough sto
walls, the tie of the roof being formed into a simple ogee cu
with small battlements along the upper edge. The bar
board takes the same ogee outline, under which bold cuspi
give a subtle variety, and are very effective against the da
cavity formed by the roof behind.

The porch at Shoreham, Kent, is more elaborate, but
been much restored. The lower part is formed as a poin
arch and is of a sturdy character well suited to last
centuries. Above are cusped and traceried barge-boar
which are in strong contrast to the horizontal and cambe
beam below.

The doorhead from Uxbridge, Middlesex, is of a la
type, principally found in towns where the building l
prevents the use of posts to support a projecting roof. T
small lower consoles with cherubs' heads harmonise well w
the graceful contour of the upper ones supporting the corn
and sloping pediment.

The carpenter should be trained to carry out such ca
ing as this, for nothing tends so much to demoralise a craf
man as merely preparing work for another to finish.

Having dealt with the timber houses of our forefathe
we may now consider other works in carpentry.

*Market Crosses.*—The Market Cross at Dunster, Som
set, is one of many which in the past engaged the carpent
skill. It is descended from the earliest type, which appe
to have consisted merely of a simple timber cross placed u
steps and afterwards adorned with statues of saints, wh

RUNTON OLD HALL, CROMER.—PART OF TERRACE.
M. H. BAILLIE-SCOTT, Architect.

no doubt occasionally reminded traders of the sacredness of bargains. It is an octagonal structure of most pleasing proportions, supported on stout oak posts, with pyramidal roof having generous eaves as a protection against the weather. The simple crowning turret and dormer windows all add to the utility and effectiveness of this charming structure.

The Market Cross at Ledbury, Herefordshire, is a rectangular example of an even more pronounced timber-type fulfilling its purpose with that directness which is always pleasing. Here the open ground storey forming the market space and protected from rain by the market hall above, has oak posts standing upon a masonry foundation. This market hall is reached by a staircase at one end and is supported on brackets springing from the tops of the posts, the walls being formed of oak studs and rails.

*Windmills.*—The windmill at Haarlem, in Holland, is an example from the country consecrated to windmills, and is a type of structure which in the past formed no inconsiderable portion of the carpenter's craft. In the low-lying districts of Norfolk and Suffolk, windmills help in an effective manner to give interest and contrast to the flatness of the country, and as they are placed to catch as much wind as possible, the timbers have to be strongly braced, tenoned and pegged together.

*Bridges.*—From windmills we pass to bridges, and the simple foot-bridge over a small creek in the Fens indicates how the craft aided intercourse in rural districts, and there is always something to learn from the framing and arrangement of the timbers in such structures which vary sufficiently to make each one a novelty in itself.

The covered bridge erected at Great Tangley Manor, Surrey, from the designs of Mr. Philip Webb, is a most pleasing example which might be more often followed nowadays in the laying out of gardens through which runs a stream. This modern example has strutted beams carrying the timber floor and posts and struts supporting the trellis roof, which is covered with many coloured clematis.

*Pergolas.*—The Tea House and Pergola at Easton Lodge, Essex, by Mr. H. A. Peto, are features which at a moderate cost might well be more frequently employed in the lay-out of country gardens, for one of the great charms of outdoor carpentry is that timber sooner takes on the appearance of age than any other material.

The pergola with its simple balustrade rests on posts and the upper part is treated with plain squared timbers. The little lake tea-house on the right is formed of oak uprights and provided with shuttered windows.

I have now dealt with external carpentry, which in all periods has been kept comparatively free from ornament; but with internal carpentry it should be observed that more freedom is naturally allowed in this respect as it is sheltered from the elements.

### *Internal Carpentry.*

*Floors.*—The dining-room at Ockwells Manor, Berkshire, shows the straightforward mediæval treatment of floor timbers, which were left exposed and truthfully indicated their purpose. In the sixteenth century, however, architects began to be ashamed to show the floor timbers, and so plastered them up, with insanitary results, since it made a home for mice and filth of all kinds. This interior shows the main beams fulfilling their purpose of supporting the sturdy joists and forming a much more effective treatment than the whitewashed plaster of the usual modern type.

Henry the Eighth's apartment at Hever Castle is a more elaborate example, with main beams into which the subsidiary joists are framed, both being enriched by mouldings. This room shows also the wall panelling, a wooden bedstead with carved oak posts, and a table, all of which indicate the good work done in the Tudor period.

The interior of the hall at "Homeleigh," Potter's Bar, is a small example of a modern building treated in the same way. It has exposed joists, above which two thicknesses of floor boards are laid with felt between to prevent the passage of sound. The upright timbers supporting the walls above honestly express their purpose, and the furniture and panelling are all in keeping.

The living room in the same house is treated similarly, and cupboards are formed above the ingle-nook. Thus by applying the principles of the past to the needs of the present we can obtain simple and satisfactory results.

*Roofs.*—The carpenter's craft provided the most ready means for effectually protecting the interiors of all buildings from the elements.

The roof at St. Sabina, Rome, was one of the first built by the early Christians, and its "king post" roof trusses are placed about 10 feet apart and support purlins on which rest the ordinary rafters and roof covering. From this simple type the mediæval craftsman evolved those elaborate roofs which are so essentially English that they stand out as unique in the annals of carpentry, for in no other country are such magnificent examples to be found.

Causton Church, Norfolk, is a splendid example of a roof which is known as the "hammer beam," and which is most frequently found in Norfolk and Suffolk. This type of roof was introduced in order to obtain greater apparent internal height by omitting the horizontal tie beam. The hammer beam, which is the short horizontal beam projecting at right angles from the walls, supports a vertical post which is framed into the principal rafter, and the weight of the roof is taken low down the wall by means of a curved brace connecting the inner end of the hammer beam to a wall piece supported by a stone corbel. The hammer beams, in this example supporting carved angels, have beautiful mouldings carried along the wall plate, beneath which are other carved angels holding shields. The roof is further enriched with tracery in the spaces between the hammer beams, curved braces and principal rafters. This form of roof causes a considerable amount of outward pressure on the walls, which, however, were strengthened by the massive buttresses of the Gothic period.

The "Angel" roof of March Church has two tiers of hammer beams, the upper one occurring at the level of the lower purlin. A number of carved angels with wide-spreading wings ornament the corbels, hammer beams, and upper part of the roof above the collar beam. The panelling at the feet of the rafters and the two supporting purlins are beautifully floriated and carved, while the curved braces to the hammer beams spring from the pinnacled canopies ornamenting the wall pieces. Although the various parts are strongly pegged together, it has been found necessary to introduce four tie rods to prevent the feet of the principal rafters from spreading.

The roof at Eltham Palace, Kent, is a splendid example of those domestic hammer-beam roofs often found in the feudal halls of our ancestors. The hammer beams project boldly from the walls and support the vertical posts which connect them with the principal rafters. From their extremities spring four-centred curved ribs to the underside of the moulded collar beams, which support ornamental wooden posts. The curved ribs are also continued down to the feet of the rafters to give additional strength, but as will be seen this has not been sufficient for the purpose, and iron straps have been introduced. The purlins support the common rafters, and are stiffened by curved wind braces in each bay.

The moulded pendants at the end of the hammer beams give considerable richness to this remarkable piece of carpentry and form a good starting point for the curved ribs which span the central part, and also for the braces which connect it below to the wall piece. These pendants were originally encased with perforated tracery secured by oak pins, but this has disappeared, the post itself being now exposed.

Staple Inn, Holborn, has a roof over the hall which although very plain and simple compared with Eltham Palace and the church roofs of Norfolk, is yet worthy of careful study. The hammer beams project boldly, and are connected by the usual curved braces to the wall pieces. The posts at the end of the hammer beams have carved pendants, and from about half-way up their sides spring curved braces, as in the old roof tree, to give intermediate support both to the collar beams spanning the hall and the purlins, which stretch from one truss to the next. The plaster applied to the underside of the common rafters has unfortunately destroyed the *raison d'être* of the visible timbers.

Westminster Hall roof is the most remarkable hammer-beam example. The hall, 290 feet long by 68 feet broad, is, with the exception of the Hall of Justice at Padua, by far the largest unobstructed area covered by a wooden roof of an artistic character. The carved hammer beams project boldly and are connected by curved braces to the wall pieces, which are taken, for precaution, low down the wall. A curved brace, as at Eltham, is here introduced to stiffen the whole framing, and it is carried from the base of the wall pieces to the underside of the collar, being joined by a second curved brace starting from the end of the hammer beams. This unrivalled example of the carpenter's craft emphasises the nobility of wood as a building material, as it more than holds its own against the fretted vault of stone, and has for over 500 years been the admiration of the civilised world.

The nave of Bangor Cathedral has a typical fifteenth-century roof of almost flat pitch which is covered with lead. This type was popular for economical reasons, as less timber was required and there was little outward pressure on the walls owing to their flatness, and they partake of the character of floors. In this example the principals have curved braces where they reach the walls, and support secondary beams which are formed into panels with carved bosses at their intersections.

The choir roof at Hexham Abbey, Yorkshire, well shows such a roof in which the principal rafters and purlins are framed into each other, their joints being marked by fine carved bosses. The broad rafters are here laid so as to show their greatest width, thus giving boldness to the design and a generous use of material, which is important, for architecture is an æsthetic art which should impress the beholder with apparent as well as with real strength.

Brinsop Court, Herefordshire, illustrates very appropriately the term "roof tree," which is so often employed to express our conception of "home." The beam not only serves the purpose of a tie to prevent the rafters pushing out the walls, but is made extra strong to support the central timbers, which spread out like the branches of a tree, helping to support the roof ridge, and give a characteristically substantial appearance to the hall.

It is not only, however, the better known buildings which are worthy of study, for many an old ruined barn, such as that at Leamington Pele, Northumberland, tells us how the craftsman took his material very much as he found it and roughly shaped it to answer the required conditions. Here the principal rafters are carried down below the tie to rest upon stone corbels, and the interest given to the framing by the natural contours of the timbers is a delightful contrast with the machine-made regularity of much modern work.

The study of old work is most of all profitable when it can be applied to modern structures, and I therefore show you two examples of timber roofs recently erected.

The plain queen post roof was constructed a few years back over a small mission room in the East End of London. Money was scarce, and the instructions were to provide a weather-proof shed at the smallest possible cost, and this design was the result. Later on, however, money was forthcoming from a liberal donor, and the alteration from a simple mission room to a more dignified church was decided upon. The view shows the transformation effected by removing the tie beams, queen posts and struts without touching the original roof covering. The tie beams were replaced by iron tie rods, and the queen posts by vertical queen rods. Curved arch pieces were inserted between the ends of what have now become hammer beams. The purlins, which had now lost their supporting struts, were trussed by means of steel rods which are truthfully exposed between the vertical studding above the hammer beams. A small king post over the collar completed the transformed roof, thus adding to the apparent height of the structure by the inclusion of the roof in its general proportion.

King's College School, Wimbledon, recently constructed, has a queen post timber roof over the school hall, which is one of the largest in England, measuring 85 feet by 42 feet 6 inches. In this case economy had to be studied, and the roof was designed to be as effective as possible under the circumstances. The tie-beam is in one piece of Carolina pine, and character is given by the use of wall pieces and struts supported on carved corbels, and by the introduction of thin slats of wood giving the appearance of tracery, and effectively helping the acoustic properties. These practical examples will, I think, be of interest to those of you who are actual craftsmen.

*Arcading.*—The arcading at Rushton Hall, Northants, shows another use for carpentry where timber columns of the Doric type, raised on sturdy pedestals, are employed to support arches which carry an upper landing. Timber, indeed, is the most suitable material for the interiors of houses, and is so much more homely and cosy than cold-looking stone or marble, that there is always something satisfactory in its use.

*Staircases.*—From arcading we pass to staircases, and that at the Castle House, Deddington, is one of a type in use since the days of the Tudors. It is a plain and unpretentious example of the Georgian period, formed with solid oak steps and, owing to the narrow opening caused by the returning flights, has a single wide newel which receives the tenons of the plain-moulded strings and solid handrails, and gives a fine breadth of treatment to the design.

*Furniture.*—I have now dealt briefly, but I hope suggestively, with the work of the carpenter in its external and internal aspects, but there yet remains the consideration of the fitting up of buildings for use and convenience. I give you some examples which are well within the domain of the carpenter, and which exhibit that solidity and appropriateness which is so pleasing.

*Table.*—The oak table is a sturdy example of the Jacobean period (A.D. 1640), the excellent workmanship of which is evident from the fact that it has lasted for 270 years. The turned legs with the footrails tenoned and pegged into them at the base satisfy the æsthetic taste, and the upper part is also well and solidly framed together. The small stool at the side with legs leaning inwards towards the top is a characteristic example of the period and was designed to be packed away under the table when not in use.

*Settle.*—The old oak table settle may fairly be regarded as the work of a carpenter. The posts are left square to receive the foot and seat rails, the former being secured to cross pieces, and the latter supported by turned legs. The shaped elbow-rests and the simple planked back, which hinges forward on wooden pegs for use as a table, indicate a desire for utility and compactness, which should commend itself to these matter-of-fact days when many try to make their homes in flats or seek the simple life in an old-style country cottage.

*Chair.*—The armchair of the time of Elizabeth has all the characteristics of previous examples, and as it has fulfilled its purpose for well over 300 years, and is still capable of being used for a similar period, it is a piece of solid workmanship which it is well to study.

*Bedstead.*—The oak bedstead at Brede Place, Sussex, is of the same period. It has solid posts with the strap pattern, above which turned balusters of excellent design support the canopy, carved with running ornament. It is a curious commentary on the repetition of history that after wooden bedsteads have been so long discarded they are now again in use. There is something so very pleasing in the solidity and simplicity of seventeenth century furniture which renders it specially suitable as an inspiration for designs for the prizes now offered by the Carpenters' Company. How much, indeed, of the later work of Chippendale, Sheraton, and Hepplewhite will thus stand the test of time, and how much of the modern gimcrack furniture with spider-like legs and meagre frames will still exist to bear evidence of sound craftsmanship 300 years hence?

*Finale.*—A lecture, however, at the best only gives general ideas, and its principal use is to stimulate imagination and kindle enthusiasm. I have, therefore, brought up for your inspection a number of sketches, made at different times, of work in wood, and also a collection of large diagrams bearing on the subject, which I hope will interest you.

Although we have now ranged over a wide field and made a cursory inspection of many buildings, we have by no means exhausted the scope of the carpenter's work, much of which is seen in the marvellous carved choir stalls, reredoses, and numerous other fittings in our cathedrals. We have, indeed, seen how a plentiful supply of excellent timber has contributed to the making of sturdy examples of craftsmanship, and ope that the pressing question of afforestation in this ntry will soon be taken up. It is certainly nothing less n a national scandal that we have to get our timber from rway and the Baltic, and that our craftsmen have to use specially grown for them by the paternal Governments Austria and Italy. The Local Government Board should lude a Forestry Department on the lines of the United tes Forest Service, which has produced such excellent re- ts in that country.

It is difficult indeed to talk of carpentry without en- siasm, and for those who have worked at the bench, as I e done, there is something in the actual making of any- ng useful and suitable for its purpose which is very in- ring. Timber in itself is a delightful material, and the asant smell of freshly-worked wood, the music produced by h successive saw-cut and the sound of the plane producing crisp shavings, act in an exhilarating way as an aid to craftsman, so very different to the unpleasant conditions aching to the dust and chippings produced by the sculptor's sel or the smell of the painter's oils. Ruskin, in the Bible of Amiens," gives us some thoughts on the beauty of ber as a material, in referring to the stalls of that hedral. "Aisles and porches, lancet windows and roses can see elsewhere as well as here, but such carpenter's k you cannot. It is late, fully developed Flamboyant, t past the fifteenth century, and has some Flemish stoli- y mixed with the playing French fire of it; but woodcarv- was the Picard's joy from his youth up, and so far as I ow, there is nothing else so beautiful cut out of the goodly es of the world. Sweet and young grained wood it is; , trained and chosen for such work, sound now as 400 rs since. Under the carver's hand it seems to cut like y, to fold like silk, to grow like living branches, to leap living flames. Canopy crowning canopy, pinnacle pierc- pinnacle—it shoots and wreaths itself into an enchanted de, inextricable, imperishable, fuller of leafage than any est, and fuller of story than any book."

I hope that those of you who are actual craftsmen will e away some pleasant recollections of the work of the past; l have renewed your belief in the nobility of the craft ich it is the special aim of the Worshipful Company of rpenters to encourage and maintain, and have gained some a of the varied treatment of timber, while those of you who otherwise interested will, I hope, henceforth do your best support good, solid and honest craftsmanship, devoid of retricious ornament, and suitable for its purpose.

## EEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

T a meeting of the Society held on Thursday, January 27— Mr. Ascough Chapman occupying the chair in the ence of the President, Mr. Percy Robinson—Mr. J. A. tch, of Kettering, author of several important works deal- with English architecture, delivered a lecture on "The zabethan House as Illustrated by Contemporary Archi- tural Drawings." In his introductory remarks Mr. Gotch, erring to the Smithson collection of drawings, recounted v Mr. Pegge, an antiquary living in the last years of the hteenth century, had mentioned as having recently been d a collection of drawings and plans of houses made by an hitect named Smithson in the reigns of Elizabeth and nes. This collection had been lost to public view until two rs ago, when it was exhibited at a meeting of the R.I.B.A. It turned out to be of unusual historical interest, showing, t did, the methods of house planning in James the First's e. There was already well known to architects another ection of a similar kind made largely in Elizabeth's reign he architect John Thorpe. The two collections supplement h other, and together afford a complete picture of the elopment of house design during the sixty years from 0-1630, a period during which were built all the fine houses wn as Elizabethan and Jacobean, including such places Burghley House, Kirby Hall, Holdenby House, Hatfield Huse, Bolsover Castle, Wollaton Hall, and many others. lecturer described many of the drawings and showed re- ductions of them upon the screen. They indicated, he l, the gradual and very interesting change which took place house planning at that period. Prior to the sixteenth tury planning had been rather haphazard; the hall, how- r, had always been the chief apartment, forming the tre of the house, with the family rooms at one end and se for the servants at the other.

John Thorpe, the typical designer of Elizabeth's time, ained this root idea, but arranged his rooms in a sym- rical manner, wing balancing wing and window answering to window. Gradually, however, the hall ceased to be the heart of the house, and instead of being the principal living-room, it became a vestibule leading to the rooms in constant use. This change was also perceptible in the Smithson drawings, and when the hall ceased to play its former part and became a vestibule, one of the strongest links with the mediæval past was broken.

The elevations (or views) of the houses included in the two collections also showed the change from the semi-Gothic treatment of the early days of Elizabeth to the more formal and Classic treatment which became fashionable at the end of James the First's reign. These changes, which led house design from mediæval ways into paths of modern methods, were admirably illustrated by reproductions from the Thorpe and Smithson drawings, which displayed at the same time the powers of draughtsmanship and of design of architects in the sixteenth and seventeenth centuries.

Mr. Gotch was at the close accorded a vote of thanks for his paper, and a discussion ensued, in which Messrs. W. H. Thorpe, S. D. Kitson, and Ascough Chapman participated.

The next meeting of the Society will be held on February 10, when Mr. Raymond Unwin will discuss the planning of garden suburbs, with special reference to the Hampstead Garden Suburb.

## ANCIENT LIGHT CASE.

IN the Chancery Division on Tuesday, February 1, Mr. Justice Joyce had before him an action by Mr. Alexander Murray Smith, owner of the freehold houses 40 and 42 Queen Anne's Gate, Westminster, against the Anglo-American Oil Company, Ltd., to restrain an alleged obstruction of ancient lights from a building now being erected by the defendants opposite on the site of 36 and 38 Queen Anne's Gate, lately pulled down.

Mr. Hughes, K.C., and Mr. Sheldon appeared for the plaintiff, and Mr. Younger, K.C., and Mr. Neville for the defendants.

Mr. Hughes stated that the title of the plaintiff and the antiquity of the lights were admitted subject to one small point, and the question would be whether the obstruction that would be caused by the defendants' new building, which was not yet erected, was one that plaintiff was entitled to complain of and have stopped.

His Lordship: Not yet erected?

Mr. Hughes: Not completed. The building is in course of erection.

His Lordship: Have they begun to interfere with your lights already?

Mr. Hughes: No. At present our light is better than ever it was before because we have nothing in front of us except a steel skeleton.

His Lordship: Where is it?

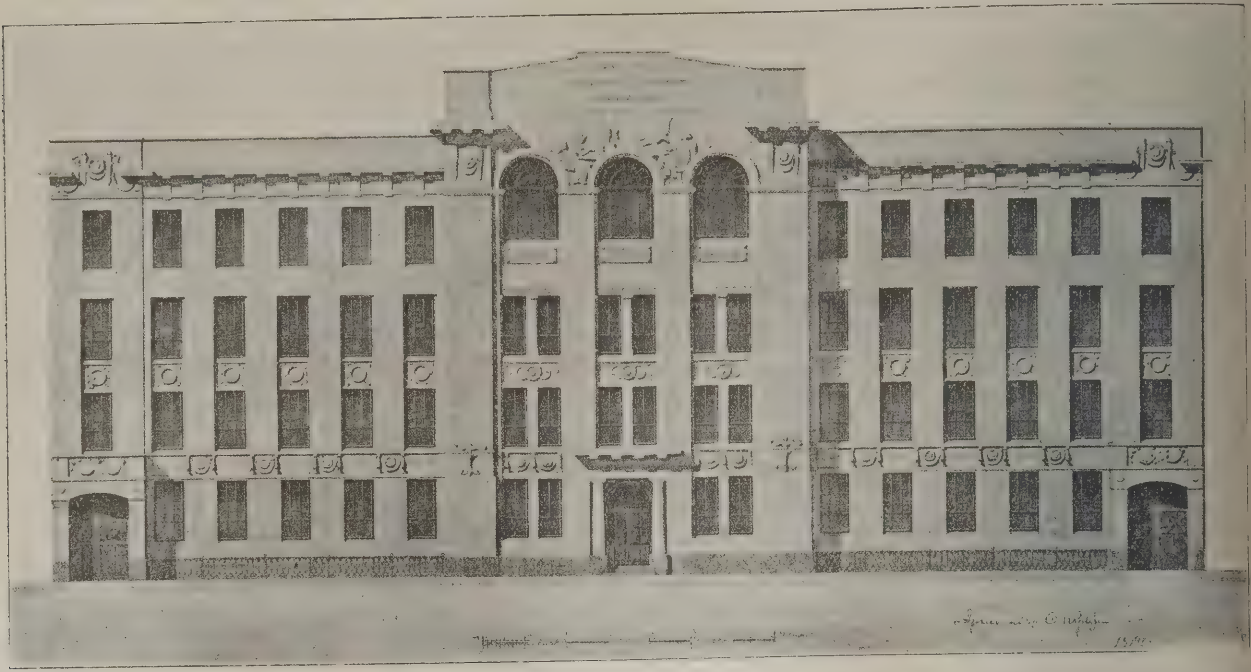
Mr. Hughes: Queen Anne's Gate. Nos. 40 and 42 belong to Mr. Murray Smith. He lives in No. 40. They are old houses. He bought one in 1899 and the other in 1902. They are not lofty houses; they have windows looking towards the north. On the north side were two houses comparatively modern, having been built in 1871. They were Nos. 36 and 38. One was occupied by the late Sir Clinton Dawkins and the other by Sir Charles Forster. His Lordship would notice from the plans that these two houses were very high relative to the width of the street, with the result that there was very little light before they were pulled down. The new building of the defendants was to be 5 feet longer to the west. Instead of being rounded off at the corner it was continued in a straight line for 5 feet further than the old houses. That was a very important point, because it very largely reduced the light coming to the plaintiff's houses. The wall of the new building was to be the same height from the ground to the cornice, 62 feet 6 inches, but the roof was totally different. The old roof sloped back at an angle of something like 60 degrees, and had in it three narrow dormers only 4 feet 9 inches wide. The new building would have four large, almost continuous, dormers 12 feet wide, in addition to big trusses.

Counsel said that in the new building there would be an equivalent to an enormous increase in the height of the wall, reducing the light in this narrow street very substantially having regard to the little there was before. With respect to No. 40 it was a matter of importance because it interfered with the immediate comfort of the plaintiff, and with respect to No. 42, which was unoccupied, it would greatly depreciate the selling or letting value.

Mr. Younger said that the case for the defence was that the height was very little above the height of the old buildings, and that there were compensations in the way of

## MODERN EUROPEAN ARCHITECTURE.

### RUSSIA.



[From *Zodtchy*.

DESIGN FOR BIOLOGICAL DEPARTMENT OF THE UNIVERSITY OF ST. PETERSBURG.—F. Korsoukhine, Architect.

absence of obstructions which would more than make up for the light taken away.

His Lordship suggested referring the matter for report to an independent expert, and both parties agreeing to Mr. John Slater, it was arranged that a joint letter should be sent to that gentleman asking him to act.

## REINFORCED-CONCRETE CHIMNEY CONSTRUCTION,*

*(Concluded from last week.)*

THE author's experiments led him to the following conclusions:—

(1) That neat cement behaved better under great heat than out of it. The average compressive strength of $2\frac{3}{4}$-inch cubes placed in flue for 28 days, after having remained in air for 14 days, was 52.6 tons on the cube compared with 33.6 tons when placed in water for a similar period; the tensile strength per square inch of the briquettes being 1,008 lbs., compared with 850 lbs. in the water test.

(2) That concrete (3 parts standard sand to 1 part Portland cement) if not well set behaved very badly under heat. The average tensile strength of briquettes 1-inch section (3 to 1) placed in flue for 28 days, after being in air for 14 days, was 105 lbs., compared with 310 lbs. at 7 days, and 460 lbs. at 28 days in water.

(3) That if the concrete had had at least a two-months' set before heat was applied a temperature of 900 deg. Fahr. would not affect it in the least. This might be taken as the safe temperature in reinforced-concrete chimneys.

(4) That the 3 to 1 specimens in these tests giving such poor results pointed to the necessity of having no voids whatever in any concrete work, it being well known that 3 to 1 briquettes made of standard sand contained a considerable quantity of air spaces.

(5) That only allowing the specimens 14 days before subjecting them to the heat was far too short a period in actual work. The greatest advantage was obtained by letting the heat get at the concrete after the longest time had been given for the cement to set.

(6) Concrete mixed with 10 per cent. of water (which should be the maximum in work of this class) would contain only about 1 per cent. of free water after a two-months' set. Heat should not be applied to concrete until the latter had had a two-months' set, a longer set than say three months would be preferable.

Reinforced-concrete chimneys had been objected to o
the following grounds:—(1) Because occasionally during th
hardening of the concrete hair cracks have been noticed o
the concrete surface, and it had been thought that thes
might affect the temperature in the chimney and conse
quently the draught; (2) because chimneys constructed o
this material were, in the opinion of some, unsightly.

With regard to the first objection, Mr. Matthews ad
mitted that hair cracks did frequently occur when a larg
concrete surface was setting, but these were only skin deep
and in the case of a chimney could not possibly affect the in
ternal temperature. As to the second objection, there wa
no reason why a reinforced-concrete chimney should be u
sightly; it could be made ornamental if required so, and a
no great extra cost.

The aggregate in the concrete in the case of chimney
was fine, but coarser material was used in the foundation
All concrete was well tamped. The factor of safety used b
well-known chimney builders in America was between 4 and
and provision was frequently made for stresses which woul
be set up by a maximum wind velocity of 100 miles an hou
a velocity which was practically unknown here.

In this country it is not at all likely that a chimney woul
ever be subjected to such a test, but in America there was
likelihood that it might be. During the Galveston (Tex
tornado, for example, which occurred in September, 190
the force of the wind was registered at 50 lbs. per squa
foot on a surface at right angles to the direction of the win
It had been the custom both in Great Britain and Ameri
to take the maximum wind pressure at 50 lbs. per squa
foot on a square shaft, and half this on a circular shaft.

No tensile stresses on the concrete were allowed for. T
chimneys were well anchored by continuing the vertical ste
bars into the foundation and then bending them through
degrees. The large number of vertical bars in the outer sh
was divided into two portions, one-half of which were be
to reinforce the upper part of the foundation slab, and t
other half, which alternated around the chimney, were be
at the bottom of the slab. All of the vertical bars in t
inner or expansion shell were carried down into the found
tions and bent over. Continuity in the steel was provid
by overlapping the ends of the bars at least 30 diamete
All wind stresses were provided for by the vertical steel re
forcement and temperature stresses by the horizontal rin
of plain round rods (as already described) bent to a tr
circle. These latter were spaced not more than 18 inc
apart vertically, and, as in the case of joists in the verti
steel, the breaks in the bars were staggered so as to occur u
evenly and form no plane of cleavage. Additional ring st
was placed at any bends in the vertical steel, as at the off
and foundation. In designing a chimney the stresses w
computed at several sections.

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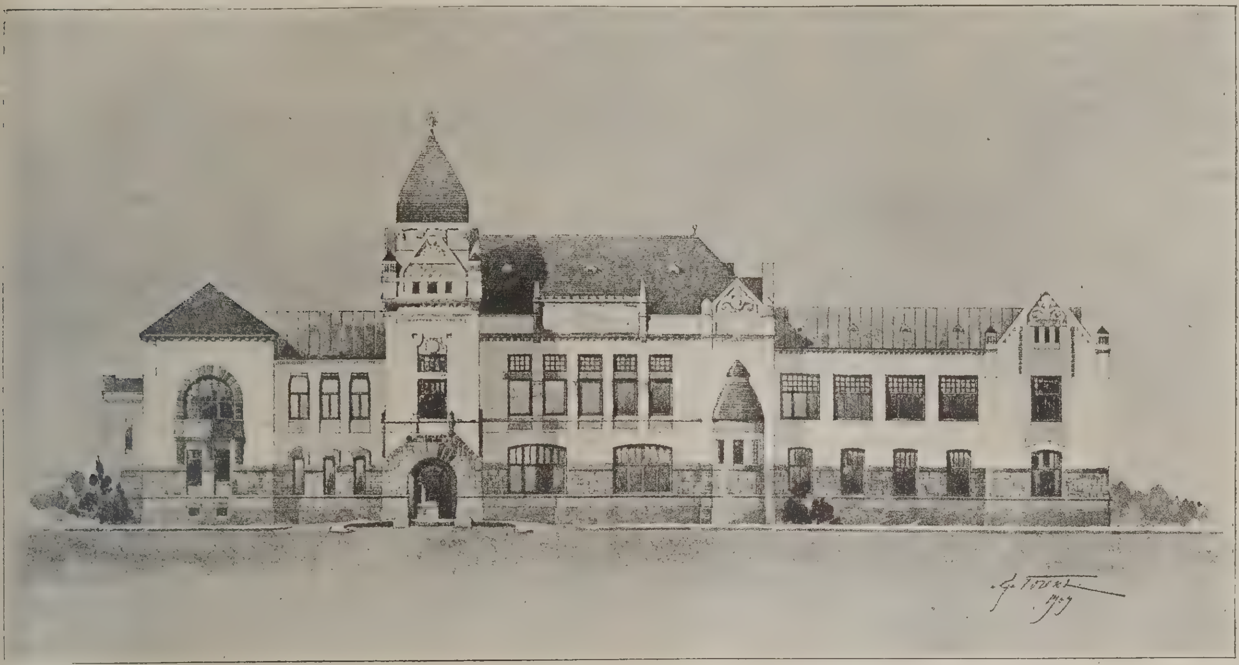
* A paper read by Mr. E. Matthews before the Concrete Institute on January 20.

## MODERN EUROPEAN ARCHITECTURE.

### RUSSIA.



[From *Zodtchy*.

BANK OF THE CREDIT FONCIER OF PENSA.—A. VON HOHEN, Architect.

The foundations were frequently reinforced by two meshes f steel bars as already explained, the top mesh running at ight angles to the side of the foundation for its full width, he bottom mesh consisting of bars laid diagonally in each lirection at an angle of 45 degrees from the side of the oundation. Additional vertical bars should be placed on he sides of the smoke opening to take the place of those mitted in that opening, and additional bars placed above nd below the smoke opening to furnish lintel and sill einforcement.

The forms used in the construction of reinforced chimneys vere necessarily somewhat complicated and intricate.

Mr. WILLIAM DUNN, in opening the discussion, said that here was no doubt that reinforced concrete was a suitable naterial for chimney construction ; the few failures were due o defects within their power to control, such as faulty con-truction or design. Up to three years ago in America there ad been about half a dozen complete failures, blown down, allen down, or torn down. But it was highly probable that American builders of such chimneys had now learnt some-hing from those failures. Mr. Dunn said that he built a rick chimney about 130 feet high some ten years ago, which ad been in use but a very short time when it badly cracked. This, however, was not due to any defect in the design of the himney, but to excessive heat from the boiler flues. The tem-erature of the escaping gases at the base of a chimney hould never exceed 400° to 600°; in this case an automatic toker had been fitted to the boiler, the coal supply had caked, nd the supply of oxygen was insufficient for proper combus-ion, with the result that the temperature reached about 1,400°. When the stoking was put right and the temperature educed to normal the cracking ceased. Brick chimneys sually show cracks owing to the temperature inside being o much above that outside, especially when there is a gale of vind and sleet. The inside lining in the lower part is a rotection, but the temperature all up the shaft remains igh, indeed, it is only about 20 to 30 per cent. less near the op than it is at the bottom. Horizontal and vertical cracks ppear in reinforced concrete chimneys, though not of an larming character. Special care with the reinforcement had o be exercised at the point where there was a reduction in he diameter of the shaft. The lesser weight of concrete himneys was not always an advantage, as, for instance, in onsidering the stability of the chimney this lesser weight on he stresses in the steel and concrete is considerable. The greater the weight of the chimney in relation to the xposed surface the less the relative effect produced by the ending moment due to wind. In a well-designed brick himney there is no tension on the windward side, as brick annot resist tension. But in a reinforced concrete chimney the line of action of the wind and dead load may be allowed to cut any horizontal section beyond the kern, as the steel takes up any tension. The durability of a chimney is largely a question of temperature: it appears from experiments with cubes and actual experience that temperatures of 400° to 600° do not injuriously affect gravel concrete. It is only when the temperature is 750° or so that injury results. This leaves only a small margin in case of excessive temperatures. Concrete formed of limestone should never be used for work exposed to great heat, as it begins to lose strength under 500°. A slightly wetter mixture than usual is desirable to secure proper adhesion to the bars. Circular rods seem preferable to T bars for the reinforcement, owing to the special care required in tamping the concrete round the T bars to secure adhesion. The contention put forward that reinforced concrete chimneys saved about half the time compared with brick ones was open to doubt, as it was very doubtful wisdom to allow the workmen to build more than a few feet a day. Another objection to the concrete chimney was its parallel form as dictated by considerations of economy. This was less pleasing than the tapered shaft. However, in America tapered shafts are now being constructed by special centring.

Mr. PERCY TAYLOR claimed that when it was considered that the stresses of a chimney were due first to weight and then to wind it would be agreed that concrete was an ideal material. None of the author's experimental samples had been in the flues for more than twenty-eight days; this was not, in his opinion, enough. He himself had been making experiments on samples that had been in the flues for more than fifteen months, and some he had not even yet taken out. A common mistake in chimney construction was to stop the lining a third of the way up; whereas if a lining was required at the bottom it was also necessary at the top, though perhaps a little thinner there.

Mr. JOHNSON described the experiments that he had conducted in connection with a reinforced concrete chimney erected at the works of Messrs. Lyle & Sons. According to his experience the concrete should be as dry as possible in order to withstand the heat. After their chimney had been erected twelve months the lining was thoroughly examined and seven or eight cracks—not hair cracks, but definite fractures—were discovered. There were not the same number on the outside as on the inside. Their experience was that the outer chimney and the lining should not be made simultaneously, as the expansion of the latter is very great. They were also led to the conclusion that the method of introducing an offset was wrong, as it was the alteration in the thickness which caused the trouble. He did not believe if at their works they had another chimney to build that they would decide to again adopt reinforced concrete. There was far more than the shape and the materials in the making of a chimney. A competent superintendent ought to be on the spot during the whole period of construction, for if a single mistake were made the chimney might be ruined.

Mr. FABER pointed out the desirability in designing a chimney of keeping the thickness as small as possible by a liberal introduction of steel. The general experience at the works of the Associated Portland Cement Manufacturers had been that in every case there was a tendency to crack on the outside of the chimney much more than on the inside. It was not yet known what exactly determines these cracks; in their case it appeared to be the temperature. If cracks are more likely to occur on the outside than on the inside, it would appear to be better to put the reinforcement nearer the outside than near the centre. It was always advisable to take a fairly low unit of stress, because the tendency of the concrete to crack made the conditions very indeterminate. It should be remembered that the expansion and contraction which occurred in concrete chimneys was not due to temperature alone, but also to the nature of the material itself.

At the conclusion of the discussion a vote of thanks was passed by acclamation to Mr. E. R. Matthews for his paper.

## BOOKS OF REFERENCE.

"Laxton's Builders' Price Book for 1910." (Kelly's Directories, Ltd. 4*s.*)

THE doyen of price books still maintains its position and its level of prices as well as its old familiar form and arrangement, from which it would be foolish to depart, as those who are accustomed to use "Laxton" would be inconvenienced if they were unable to find things where they are wont to be. At the same time due note is taken of advances in building matters. Thus electric lighting, its rules and prices, are brought up to date; the London County Council General Powers Act, 1909, so far as amending the London Building Acts, is included, and so also is the Cinematograph Act, 1909, together with the regulations under that Act.

"Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price Book for 1910." Edited by Francis T. W. Miller, A.R.I.B.A. (Crosby Lockwood & Co. 4*s.*)

Lockwood's Price Book also makes its yearly appearance, and retains its own points which make some prefer it to "Laxton." The prices are not on the high grade, but on what is now the ordinary level of good everyday work. A useful feature is the annotations from the London Building Acts with references to decided cases, by Mr. A. J. David, B.A., LL.M.

"Spon's Architects' and Builders' Pocket Price Book." Edited by Clyde Young, A.R.I.B.A. Revised by Stanford M. Brooks. (E. & F. N. Spon, Ltd. 3*s.* net.)

Being a pocket-book, Spon's does not vie in size or completeness as regards prices with more bulky volumes, but it is more than a price book and contains a large amount of useful information on many matters connected with building. An addition to the present edition is the inclusion of tables of constants of labour in all trades, which gives particulars of the time in which workmen ought to do specific kinds of work.

"Jordan's Tabulated Weights of Angle, Tee and Bulb Iron and Steel." By Chas. H. Jordan, M.I.B.A. (E. & F. M. Spon, Ltd. 7*s.* 6*d.*)

Although primarily intended for the use of naval architects, shipbuilders and manufacturers, these tables should also be valuable to architects and builders as giving information as to the weights, sizes and sectional areas of various forms of rolled steel that are less used than they might be in building by reason of the non-recognition that H steel joists, angles and channels are not the only shapes on the market.

"The Local Government Annual and Official Directory, 1910." Edited by S. Edgecumbe Rogers. (The Local Government Journal Office. 1*s.* 6*d.*)

Besides its use as a directory of the officials connected with local government this annual contains useful abstracts of the more important legislation of the past year connected with and affecting local government.

"The Local Government Manual," 1910. (Shaw & Sons. 7*s.* 6*d.* net.)

This volume has now reached its fifty-fifth year of publication, and it becomes more comprehensive with each edition as the ramifications of the Local Government Board steadily increase. The publishers say that it is corrected up to December of last year, and they have included some additional matter. The 800 odd pages are crammed full of lists of public bodies and public officers of all sorts. The list of urban districts and rural district councils, with the names and, in many cases, the addresses of the officers, alone occupies 160 pages. The arrangement is most orderly, and the information sought can be quickly obtained.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* illustrates two church buildings which are not very successful renderings of Gothic, and a number of drawings by students of the Society of Beaux-Arts Architects.

*La Construction Moderne* gives a full account, with illustrations, of the church of Jesus Adolescent, which is in course of construction at Nazareth, Palestine, as the centre of an orphanage founded by the R.P. Athanase Pruy, and has been designed by M. L. Gauthier.

*Berliner Architekturwelt* is devoted entirely to the work of Alfred Grenander, one of the leading architects of Berlin, whose work, with an ultra simplicity of detail, is full of piquancy and evidence of thought.

*Het Huis* continues its account of the charming old town of Oud-Deventer, and also has an article on Old and New Enkhuizen, both of which are fully illustrated. Some examples are also given of modern internal treatments.

The *Architectural Review*, in its August number, which has just reached us, illustrates the work of Messrs. York & Sawyer, which is largely concerned with banks and other financial institutions, and is remarkable for its severely classical treatment.

*Engineering Record* has an interesting illustrated description of the grand stand at the Minnesota State Fair Grounds, in which is included a formula for the design of an isacoustic curve.

The *Engineering Magazine* commences a series of articles on "Industrial Applications of Reinforced Concrete," with references to examples erected in the United States, in which is discussed in general terms the merits of the various methods of constructing buildings of steel and concrete.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### The Competition Question.

SIR,—Mr. Gibbs's suggestion—excellent as it is—is unlikely to be adopted by promoters. Why not go to the root of the matter and prevent architects from wasting their time? We all prepare sketch plans which are subsequently only elaborated, and if we get on wrong lines in the draft plan all work is thereafter wasted. Consequently we suggest that competitors submit their sketches in the initial stage to the assessor, from which a limited number could be selected. To ensure the assessor being safeguarded from suspicion of preference the sketches could be sent through the President of the Institute (in whom we all have confidence), who could number same and return after being submitted as suggested.—We are, &c.,

February 1, 1910. LEEMING & LEEMING.

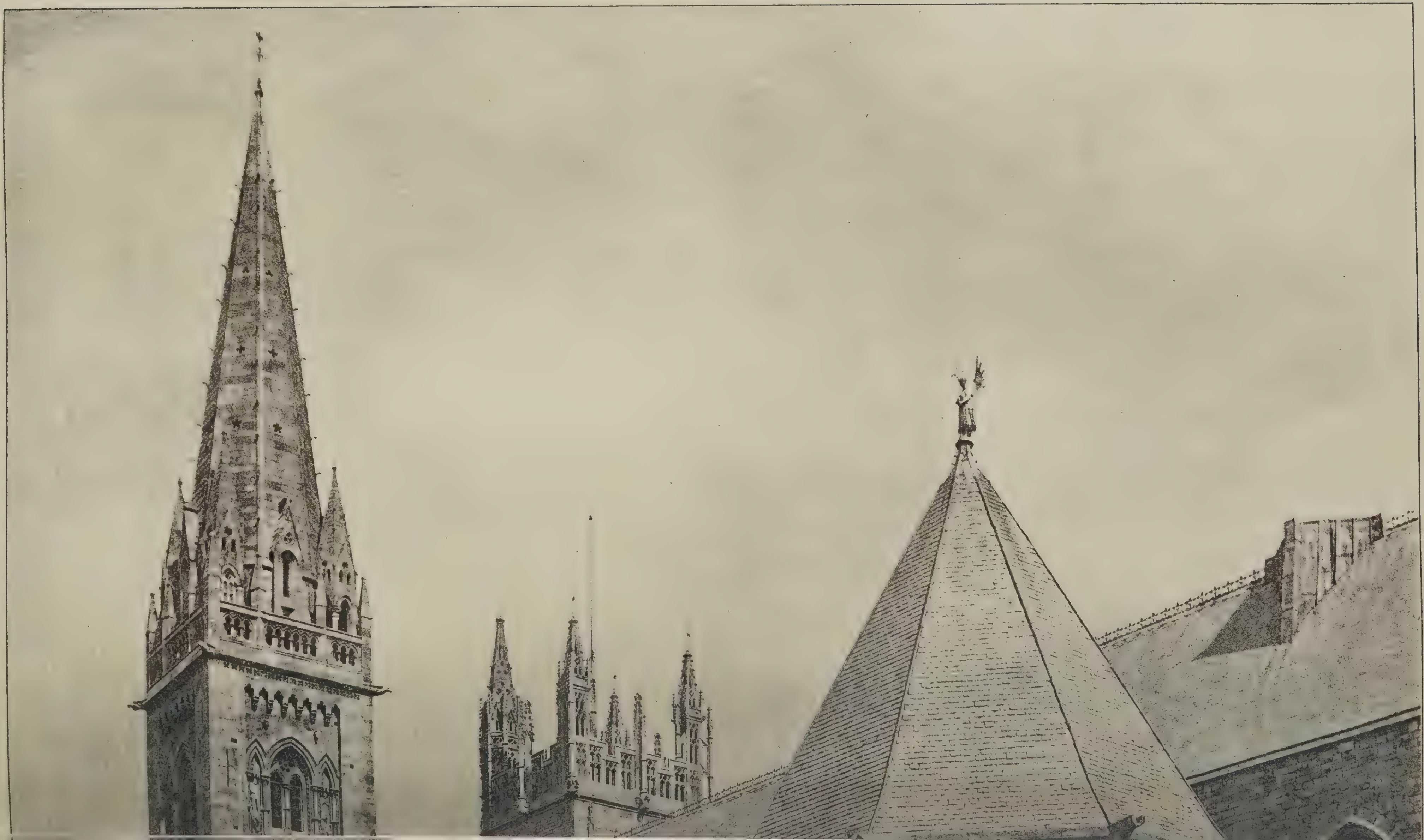
## GENERAL.

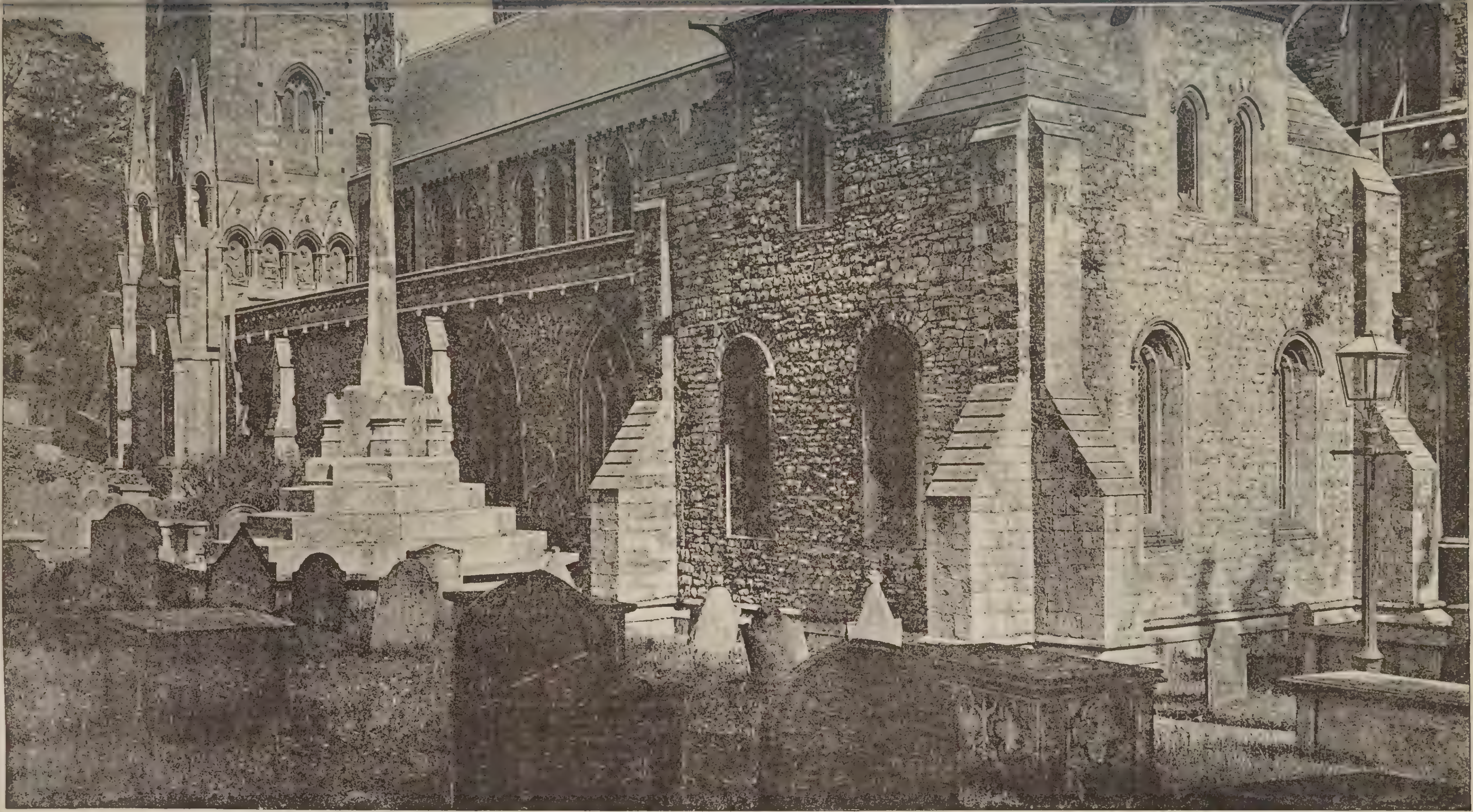
DUMBARTON Burgh School Board have asked the local architects to submit competitive plans for a Burgh Academy to be erected at Braehead. The plans will be sent to an assessor yet to be appointed for adjudication. The new academy, or higher-grade school, is expected to cost 20,000*l.*

"SELECTIONS from the Portfolios of J. MacWhirter, R.A.," is the title of an exhibition which is to be opened to-morrow (Saturday) at the Leicester Galleries, Leicester Square, W. It will comprise water colours painted in Scotland, Norway, Switzerland, Italy, Greece, and America during Mr. MacWhirter's various visits.

OF THE
UNIVERSITY of ILLINOIS

The Architect, Feb: 4th 1910.





INK PHOTO SPRAGUE & Co Ld 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

CATHEDRAL SERIES, No. 659.—LLANDAFF: FROM THE SOUTH-EAST.

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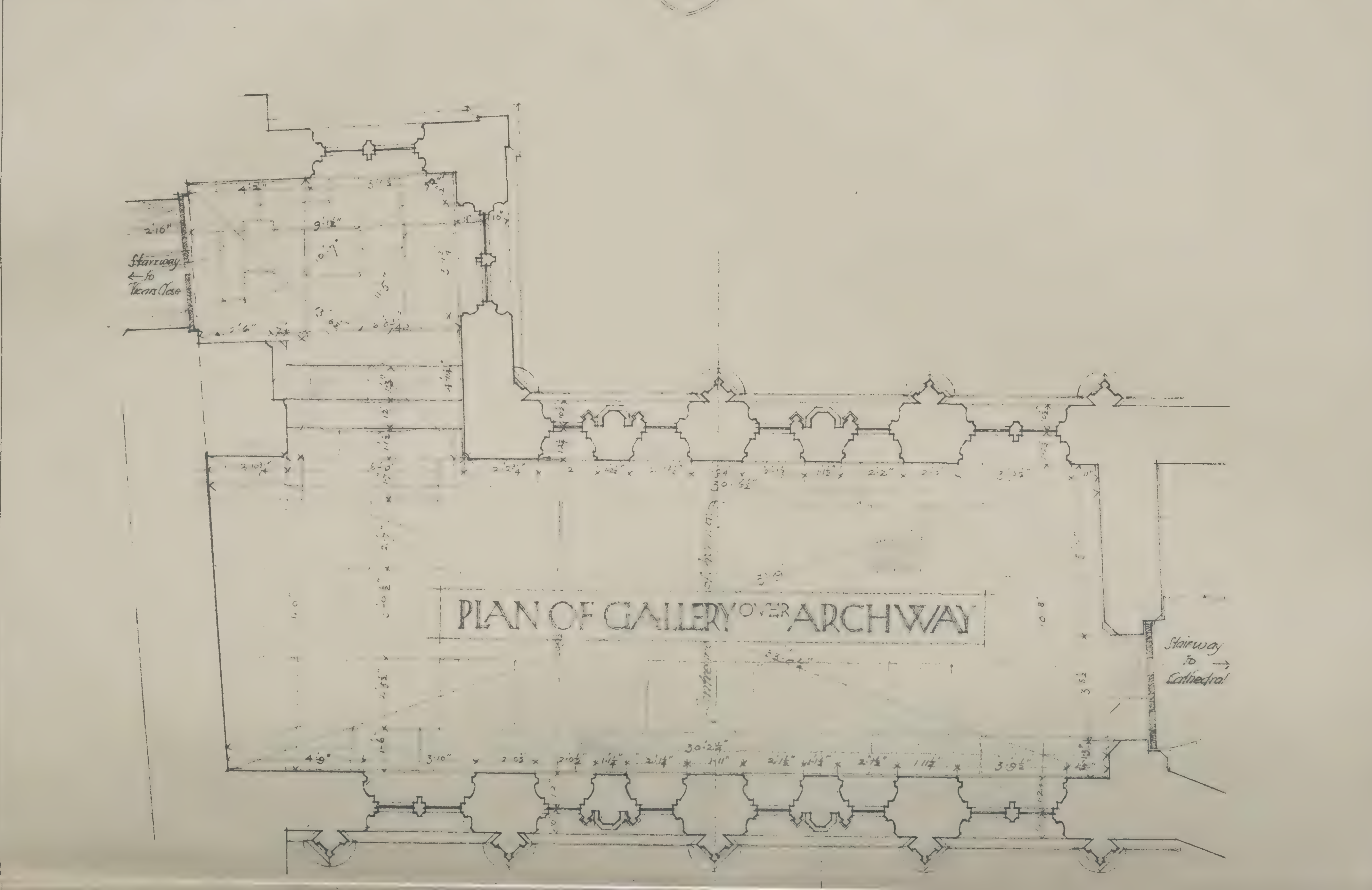
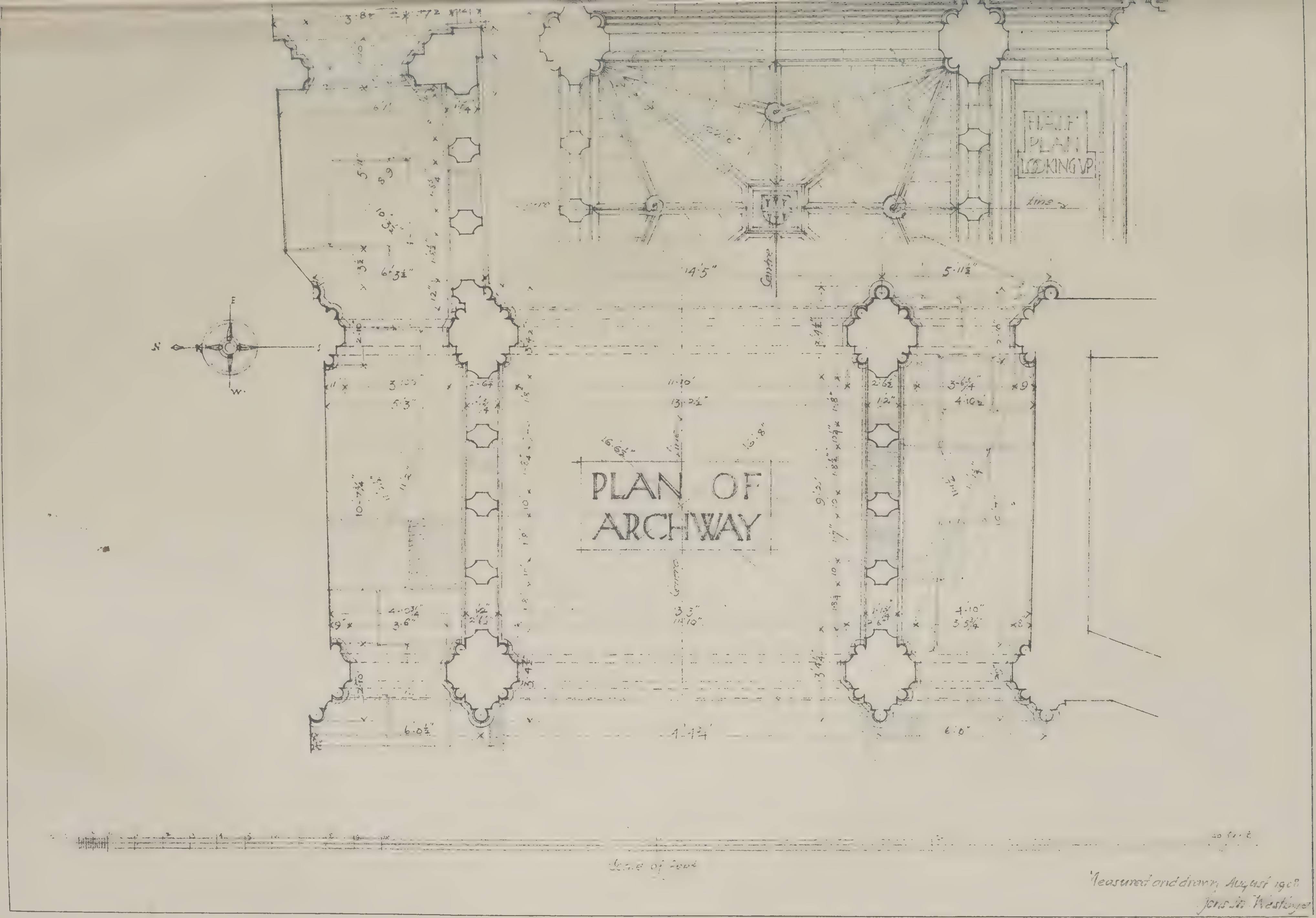
# THE CHAIN GATE AND GALLERY WELLS CATHEDRAL SOMERSET





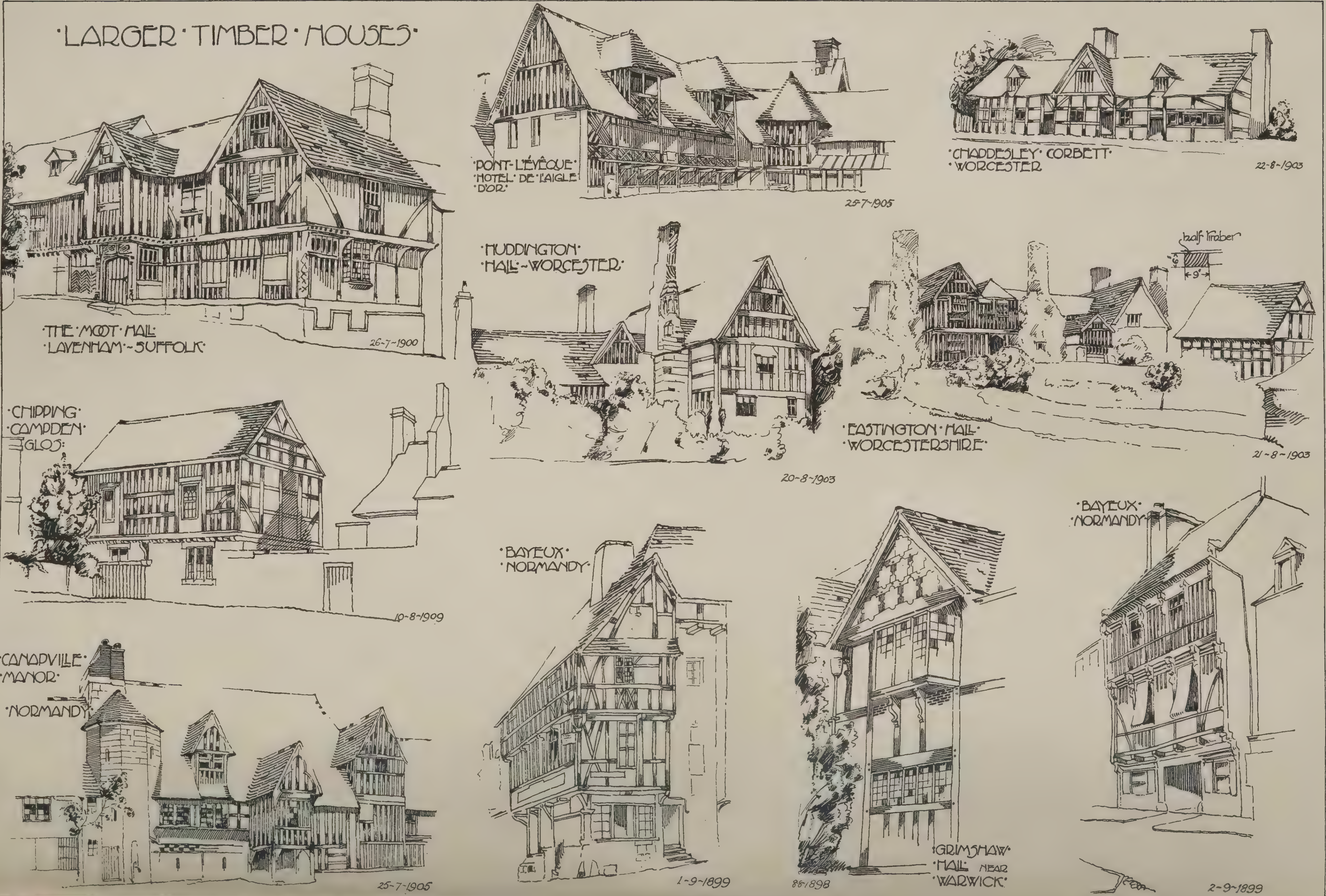
"INK-PHOTO" SPRAGUE & C° L™ 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Chain Gateway, Wells Cathedral.

Measured and Drawn by JOHN TH. WESTBYE, Architect.

UNIVERSITY [illegible]

# ·LARGER·TIMBER·HOUSES·



·THE·MOOT·HALL·
·LAVENHAM·-SUFFOLK·
26-7-1900

·PONT-L'EVÊQUE·
·HOTEL·DE·L'AIGLE·
·D'OR·
25-7-1905

·CHADDESLEY·CORBETT·
·WORCESTER
22-8-1903

·HUDDINGTON·
·HALL·-WORCESTER·
20-8-1903

·EASTINGTON·HALL·
·WORCESTERSHIRE·
21-8-1903

·CHIPPING·
·CAMPDEN·
GLOS:
10-8-1909

·CANAPVILLE·
·MANOR·
·NORMANDY·
25-7-1905

·BAYEUX·
·NORMANDY·
1-9-1899

·GRIMSHAW·
·HALL· NEAR
·WARWICK·
8-8-1898

·BAYEUX·
·NORMANDY·
2-9-1899

# SMALLER TIMBER EXAMPLES

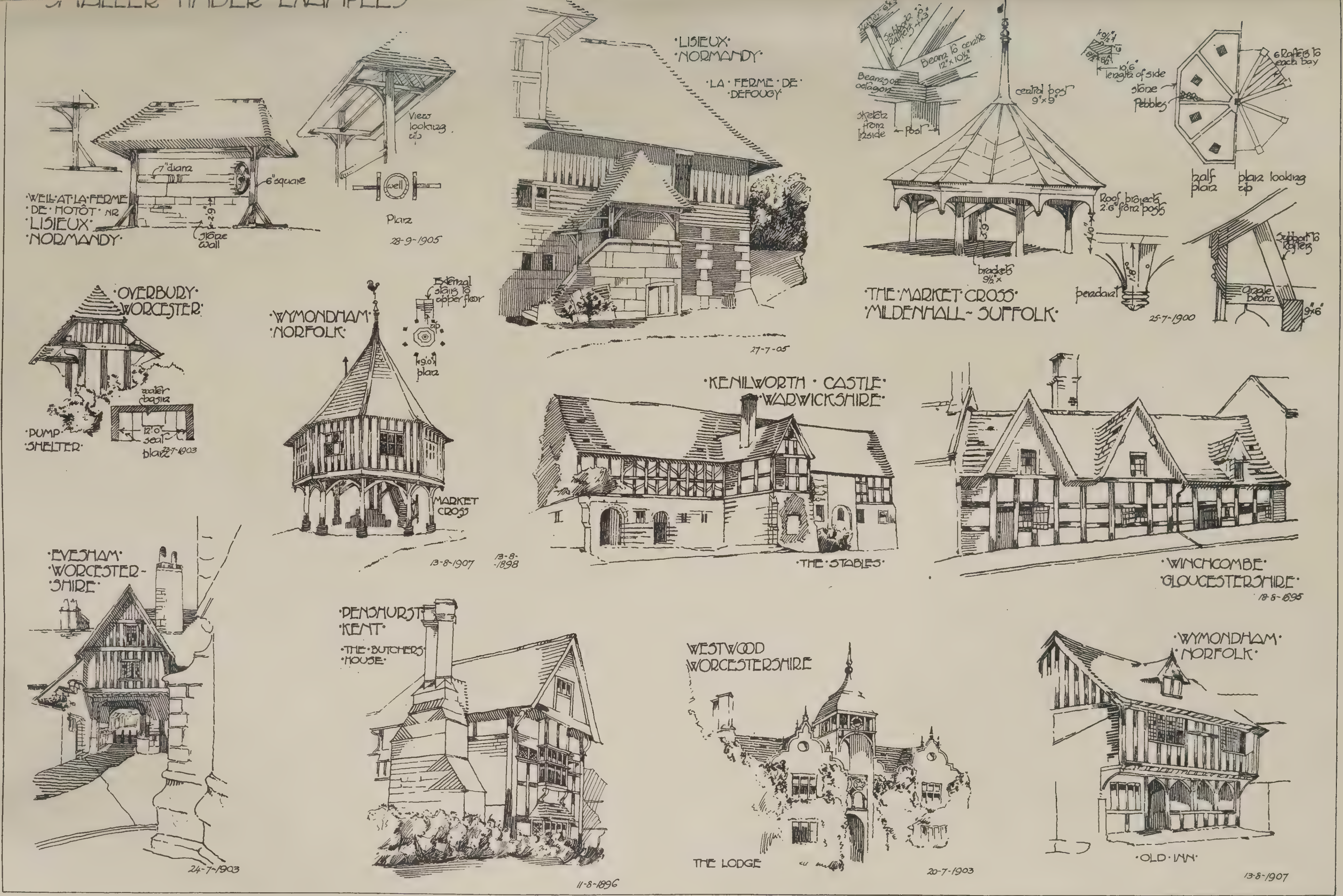


PHOTO-LITHO SPRAGUE & C L 4 & 5, EAST HARDING STREET FETTER LANE E.C.

FROM SKETCHES BY BANISTER F. FLETCHER, F.R.I.B.A.

OF THE
UNIVERSITY of ILLINOIS

The Architect.

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## FORTHCOMING EVENTS.

*Monday, February* 14.

Royal Academy: Course of Four Lectures on Architecture, by Professor R. T. Blomfield, A.R.A. (1) "Philibert De L'Orme.

Royal Institute of British Architects: Paper on "George Frederick Bodley," by Mr. Edward Warren, F.S.A., F.R.I.B.A.

*Tuesday, February* 15.

Illuminating Engineering Society: Discussion on "Glare, its Causes and Effects," resumed from the last meeting on January 11.

*Wednesday, February* 16.

Carpenters' Company: Paper on "The Art of the Leadworker," by Mr. Lawrence Weaver, B.A.

Northern Architectural Association: Paper by Mr. Frank Rich, F.R.I.B.A.

*Thursday, February* 17.

Royal Academy: Course of four Lectures on Architecture, by Professor R. T. Blomfield, A.R.A. (2) "Jean Bullant."

Royal Institution: Paper on "Illumination, Natural and Artificial," by Professor Silvanus P. Thompson, B.A., &c.

Carpenters' Hall: Paper on "English and Mediæval Fonts and Monuments," by the Rev. W. Marshall, M.A., F.S.A.

## MAKING THE BEST OF THE HOME.

HOW to make the best of their homes is the lesson that Mr. W. S. Sparrow is endeavouring to teach the British public in his latest book,* and as the basis of his lesson is the necessity for good architecture, we hope he may find intelligent and receptive pupils.

In a pleasant and chatty fashion Mr. Sparrow traces the growth of the English home from the cave-hall and penn-pit of prehistoric man through the hall of Saxon and mediæval days to modern times, wherein he rightly notices the recognition by modern architects of the value of a great house-place, a fine hall, and formulates as the principles that govern the best modern work the desire (1) to treat with common sense and a just freedom the best traditions, both Gothic and Classic; (2) to break away from that intricate planning which from the sixteenth century to the eighteenth gradually separated household comforts into so many rooms that they became expensive discomforts; (3) to arrive at moderation and economy without any loss of essential comfort and privacy. The author points out the connection of the problem of modern home-planning with the social conditions that should now receive attention:—(1) A growing cost of production, and therefore an urgent need to simplify all workmanship, so that money may be spent on essentials and not on unnecessary walls, superfluous bandbox rooms, and meretricious ornamentation; (2) a greater cost for household expenses, owing to higher rents and to train fares and 'bus fares, and to dearer wages for service; (3) more labour and less pay for those of us who are not considered working men, because our day's toil is twelve hours or so of brain effort; (4) a decreasing birth-rate, particularly among those that know the penalties of trying to succeed to-day without capital.

As a protagonist for improvement in home-making, Mr. Sparrow deals with those factors of modern life which he considers to be "hindrances to success in home-making," and discourses of (i.) want of public criticism, (ii.) the power of advertisement, (iii.) the shop system as architect and decorator, (iv.) the abuse of mechanical aids in craftsmanship, (v.) the popularity of shams, (vi.) an excessive pride in home-making, (vii.) want of popular education in house architecture, (viii.) the house-servant difficulty, (ix.) differences of taste between women and men, (x.) local by-laws. Of all these the author treats in trenchant fashion and inculcates many useful lessons and suggestions.

In his chapter on the house plan, Mr. Sparrow emphasises the importance not only of a well-considered arrangement by the architect, but of a proper comprehension of the plan by the client, and advocates the employment of the method he has recommended for laying out full size the plan of a house on the site before the contract is settled. The various points that should receive attention in the full-size plan are dealt with in detail, the positions and size of windows, of fireplaces, of doors, the question of large halls and few rooms rather than many small ones, a type of planning of which Mr. Sparrow is a strenuous advocate, as giving with economy a wholesome sense of bigness and comfort.

Having discussed the varied aspects of planning, our author then directs his readers to the consideration of "Homes from outside," and, dealing with roofs, discusses the question of pitch, as to which he lays down no dogma, but takes a broad and catholic view, of tiles and slates and thatch, pointing out what is good and what cheap and nasty. Then he treats of walls and their materials, and starts on ferro-concrete, which he rather seems to think has a claim to cheapness and a lack of humanity that bodes ill for home-building. This, however, is a groundless fear at present, for ferro-concrete has a long journey to go before it will reach the level, even on the score of expense, of good honest brick and stone, tile and rough-cast. Monolithic concrete, as he points out, has failed to compete on economic grounds with the older methods of building, and we have little fear that ferro-concrete will be more successful. Should it be so, then no doubt our modern architects will still find a way of imparting to the new method an artistic expression.

The characteristics of various kinds of stone and of brick are fully discussed, both practically and æsthetically. We are not surprised that Mr. Sparrow, filled as he is with hearty appreciation for the quiet repose of old English building, looks askance at the suggestions for polychromatic treatment of walls that have been frequently made and sometimes attempted, but we do not share his views entirely, and think that when the right colourist comes along, polychromatic architecture will be a success. But we may have to wait a long time for the right colourist.

From walls the author passes to windows and doors, but in a book evidently intended for the lay reader and the amateur the æsthetic merits of pointed windows have received somewhat too much emphasis and may cause trouble to architects whose lady clients imbibe enthusiasm for a form that experience has shown to be inconvenient in the presence of blinds and curtains. Not much is said about doorways except to extol the eighteenth-century treatment that made the portal the one bright spot of design in a wilderness of monotonous plainness in many a town house.

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* *Our Homes and How to Make the Best of Them.* By Walter Shaw Sparrow. (London: Hodder & Stoughton. 7*s.* 6*d.* net.)

Having dealt with the house from the outside as well as from its organic construction on plan, Mr. Sparrow then proceeds to talk of furniture and teaches further useful lessons, the desirability of good wood and honest craftsmanship, the economy of thoroughness, the avoidance of that which is much advertised and of that which is sold by retailers and the superiority of furniture produced by the craftsman, all of whose price is exchanged for honest value in material and workmanship. But how is the uninformed public to find the skilful and the honest craftsman who does not advertise?

Furniture is followed by a chapter on "Rooms and Their Decoration," and the author deals with just severity as among the things to be avoided, "faults of realism," whether in carpets, upholstery, wall-papers, or fabrics for curtains. The maxims laid down by William Morris as regulating the use of patterns in design are quoted, and moderation in the use of patterns is advocated even to the disparagement of Morris, who, as the author points out, was on occasion apt to overload his decoration with pattern design.

Scarcely anything in this very informative book is of more value than the pages on "Decorative Colour," which commence thus:—"Colour, you will understand, is very different from colours. Colours are pigments such as are bought in tubes and in cakes, while colour is a perfect harmony produced by a fortunate combination of several or of many. Colour, in even its simplest effect, is never pure pigment. Its white is not cold, but warm like the tint of cream or iridescent like the inner part of a sea-shell. Its reds and blues are not known by the names of paints; each is a composed tint, a thing created by a fine sense of colour, as rhymes and cadences in poetry are created by a nicely-balanced feeling for the music of words. And this gives you one guiding principle: *Having learnt by heart the pigments sold in shops, decline to accept them pure in anything pretending to be a work of harmonious decoration.*"

Definite instruction is given as to the mental effect of various colours and definite advice as to the best practical methods of judging the harmony or discord of tints and materials in juxtaposition. Especially sound is the author's doctrine and one well worthy of note by his lady readers, that "carpets and walls should oppose each other, should make contrastive harmonies, and not have tints of the same colour." If there is one pitfall into which the amateur decorator is more likely to fall than any other, it is that harmony is to be obtained by matching the tints of the carpet and the draperies, and repeating these in the painting of wood work and the colours of the paper hangings.

The part that is played by the ceiling, the frieze, the filling and the dado, and their desirable treatment are severally elucidated, and so also is the right use of water-colour drawings and etchings as part of the general scheme.

"Flats and Flats" is the subject of the final chapter, and is chiefly dealt with as a disparagement of the flat as a home, but suggestions are given for the minimising of its defects.

Needless to say, Mr. Sparrow's latest book is full of excellent illustrations, both in black and white and in colour, of some of the best work of some of our best modern architects of homes as they should be.

## NOTES AND COMMENTS.

The report which we give elsewhere of the further proceedings in the ancient light case of Smith *v.* Anglo-American Oil Company shows how the new method now adopted by the High Court for settling these technical questions is being operated, and illustrates how much expense could be saved to architects' clients by a simple reference to an impartial adjudicator like Mr. John Slater. Arbitrations are sometimes very expensive affairs when crowds of witnesses, counsel, and solicitors spend days and weeks in thrashing out a multiplicity of technical details; but the system now adopted by Mr Justice Joyce is simplicity itself, and can be worked with the minimum of assistance from the lawyers.

Dry-rot is troublesome in the United States as well as in Great Britain, and in a leading article the *Engineering Record* gives instances of some recent occurrences. A suggestion is made with regard to the use of wooden posts that these should have an 1½-inch hole bored through them lengthways and two ½-inch holes cross-wise near the top and bottom, with the view of removing the pith, which is particularly liable to rot, and of providing ventilation through the middle of the post. As here, our contemporary is able to quote instances of the rapid decay of wood flooring laid on concrete and covered with linoleum, about the most effective agent in inducing the spread of dry-rot that modern conditions of life have introduced.

The *Times* devotes a column and a half to an eulogistic account of Mr. Herbert Baker's work in South Africa and his scheme for the erection of the new public buildings of the Transvaal Government on the heights of Meintjes Kop, overlooking the city of Pretoria, and, as described by the *Times*' correspondent, an ideal site for a South African acropolis. Mr. Baker proposes to place two identical blocks of offices on the level ground of the shelf of Meintjes Kop, one at either side of the break, and to link them with a semicircular colonnade running round the hollow behind them. He suggests that the hollow itself might be converted some day into an outdoor amphitheatre of seats after the old Greek fashion, where a large gathering of people could be assembled on occasions of national ceremonial. In front and facing the town there will, in process of time, be gardens and terraces and public statues. On the slopes below the shelf will be room for future additional blocks of offices. There is every prospect, too, that the municipality, which (like most of these bodies in South Africa) owns a large tract of "town lands" at the base of the kopje, will co-operate with the Governmen by laying it out as a public park. Finally, Mr. Baker has designs on the extreme spur of the kop to the west for a Union monument or "Temple of Peace."

Glasgow has probably suffered as much as any city in Great Britain, not even excepting London, from fog and the Corporation are taking active steps to minimise the evil. At a meeting held on Wednesday in last week presided over by the Lord Provost, it was resolved to form in Glasgow and the West of Scotland a branch of the Smoke Abatement League of Great Britain, and in opening the meeting the Lord Provost referred to the formation about twenty years ago of the now defunct Glasgow and West of Scotland Smoke Abatement Association the most important result of whose labours was the valuable smoke-prevention section of the Glasgow Police (Further Powers) Act, 1892. That Association, he said had also left the Corporation a legacy, now amounting to 182*l.*, under the proviso that it should be employed in furthering the objects of the Association; and it seemed now that the time was fully ripe for the utilisation of that legacy. They had experienced afresh, during last November and December, the debilitating and destructive effects of "black fogs," by which many deaths were caused, health was endangered, shipping was paralysed, trains were delayed, goods were besmirched and spoiled, and even the streets became unsafe. After emphasising the point about the number of deaths traceable to the fogs, his Lordship proceeded to say that the Corporation of Glasgow had agreed to hold an exhibition in the city of heating appliances to show that they would yield the warmth desired without smoke production. They had also passed a resolution calling upon the heads of departments to report upon heating appliances at present being used, with a view to the substitution in the various offices and halls under the Corporation of a method of warming which would not pollute the air. In this way they sought to be an example to the citizens, as well as a terror to evil-doers.

Mr. John Watson, F.R.I.B.A., at a recent meeting of the Edinburgh Photographic Society, read an interesting paper on "The building of Holyrood Abbey Church, as evidenced by the existing remains." Mr. Watson pointed out that when the building was contemplated the prevailing style of architecture was that of the Norman Romanesque. By that time the component parts of the church had attained to perfect clearness in arrangement and expression of form. The great churches of the first-class were usually planned on the Latin basilican type with transepts, while those of what might be called the second class were built on the parish church plan, consisting of a nave, chancel, and apse, with or without aisles or transepts. The former type of plan passed from France through England into Scotland, and was particularly associated with buildings of the Benedictines. Durham Cathedral was an early and important instance, and in the North of England its plan formed the type of a distinct school, whose influence spread to Scotland. There seemed to be little doubt that the plans of both Dunfermline Abbey and Kirkwall Cathedral were directly inspired from that source, and from the similarity it might be assumed that Holyrood as well was a near descendant. The nave conformed to the Durham Benedictine type, and that the vanished eastern portion of the church did so also might be inferred. This view was not unwarranted, as the greater part of the South of Scotland was in the See of Durham. In dealing with the existing remains, Mr. Watson traced the history of its foundation in King David's time to its present condition, assuming that building operations began under the first charter granted in 1128. There had been at least five distinct periods of erection—(1) The original choir, represented by the Norman doorway in the south aisle; (2) the transitional work of the north aisle and lower part of the west front followed by the very early First Pointed work corresponding to the Early English; (3) the arcades on the north tower, the upper parts of the west front, the triforia, and later the clerestory and vaulting; (4) the north transept, and (5), the south transept. The church, they might assume, would take about 250 years to complete in all its essential parts. In another generation others were called in to erect those sturdy buttresses possessing such a Scottish flavour which they saw on the north and south sides of the church. They were erected by Abbot Archibald Crawford early in the second half of the fifteenth century. Towards the close of Charles II.'s reign it appeared that the abbey was Government property, and in 1672 the nave was reconstituted as the Chapel Royal of Holyrood House for the use of the Royal Family. In 1758 the attention of the Government was called to its condition, and the builder called in loaded the vault with a deadweight it was never intended to carry, with disastrous results. Since the fabric came under the care of Mr. Oldrieve, of the Board of Works, the preservation of the old walls had received careful attention, and the repairs supervised by him for their preservation were being done in a manner which made one regret that the same thorough method had not been adopted earlier.

# MODERN COLD STORAGE AND REFRIGERATION.

## IV.—THE REFRIGERATING MACHINE.

By W. S. Douglas, B.Sc.

Ice cooling does very well for small chambers, and even at fairly large capacities can still, in some cases, be used with good effect. But its principal advantage, which renders it so suitable for small work, is its low first cost, and this, as the storage volume increases, becomes less and less in proportion until it is finally altogether eclipsed by the substantial benefits attending the use of mechanical refrigeration. The circulation of dry air made possible with this system eliminates all danger from dampness, and this, combined with the low maintenance and running expenses, and the simplicity of operation, renders it at higher capacities in every way superior to ice. It is now used without exception for all purposes, where a large amount of cooling is required.

The system depends for its existence on the refrigerating machine, which appears at the present day in four different forms, based on four distinct principles. These are:—(1) Water evaporation; (2) cold air expansion; (3) vapour absorption; (4) vapour compression. The first type is only for very small machines. The second type is now almost out of date, and, although used to a certain extent in marine work, its application even there is very limited. The third has a fair amount of popularity on land, and is useful where exhaust steam can be utilised, but the great majority of the machines now made work on the fourth principle, known as "vapour compression." With this system greater simplicity, less waste of floor space, and, unless exhaust steam is available, higher economy are obtained, than with either of the others.

Beginning with the most important system, vapour compression machines may be sub-divided into three main classes. The use of volatile gas, alternately compressed and expanded, is common to the three divisions, but the nature of the gas employed differs. Those principally in use are:—(1) Carbon dioxide; (2) ammonia; (3) sulphur dioxide. Others such as ether, methyl chloride, water vapour, bi-sulphide of carbon, &c., have been tried, but although the two first-named are employed by one or two makers on the Continent, none of them is practically applied in this country. Each of the three principal gases has its advantages and disadvantages, as far as refrigeration is concerned, but the fundamental principle underlying their action is the same for all, and, up to a certain stage, without going into the question of individual superiority, they may be considered together.

The cooling effect in vapour compression, and also in absorption machines is produced by the agency of what is known as "latent heat." To call this agency into being, a change of physical state is necessary, for example from the liquid form to the vapour, and it is for this reason that easily vaporised substances, such as the volatile gases named above must be employed.

Latent heat is the direct opposite of "sensible heat"; the latter has a visible effect on the thermometer, but the former has none whatsoever. This sounds at first rather puzzling, but an easy explanation is furnished by considering a very common substance as it changes successively from the solid form to the liquid, and from the liquid to the vaporous.

It will be supposed that we have a small block of ice, and that in it is embedded the bulb of a mercury thermometer; the temperature at the beginning is regulated to say, zero Fahrenheit,—thirty-two degrees below freezing point—and heat is then steadily applied. What takes place? The ice does not melt, but the temperature gradually rises, and the mercury creeps up the thermometer scale until it registers 32° Fahr. Melting then begins, and a very curious thing is seen to happen. Heat is still being absorbed as steadily as before, but, in spite of that, not the slightest change can be observed for some minutes in the position of the mercury column. It remains constant at the thirty-two mark, and continues to do so until the last particle of ice has disappeared. Then, and not before, the temperature again begins to rise, but this time at only half its previous speed, and at this reduced rate the advance is continued until the water is at 212° Fahr., but at that point, as the formation of steam commences, the same phenomenon is again observed. No change is made in the rate of absorption of heat, and yet the temperature remains stationary until every drop of water has been evaporated. In fact, in this case, an even more striking example is furnished than in the case of ice, as the period during which the temperature rise is retarded is nearly seven times as long.

Further heating, when all the water has been converted into steam, causes the mercury once more to expand in the usual way, the speed being restored to rather more, if anything, than its original value with ice, and the advance is continued until, at a very high temperature, chemical dissociation occurs.

Now it is apparent, since heat was supplied all the time during the formation of water from ice, and of steam from water, that, although in both cases no sign was given by the thermometer, absorption must necessarily have taken place. In fact, the heat has been, as it were, secreted, and is called for obvious reasons "latent." This mysterious absorption is explained by scientists on the lines of the Kinetic Theory, but as yet no definite numerical relation has been established to connect the theory with practice. Nevertheless, it is quite real, and to prove its actuality, reference may once more be made to the sensation of cold, which is produced by the evaporation of ether in the palm of the hand. This is solely due to absorption of latent heat.

Any change of state is accompanied by the same phenomenon, and although in some cases it is more pronounced than in others, it is common to all substances. The latent heat of ammonia, for instance, is under corresponding conditions 4.55 times that of carbon dioxide. That is to say, in order to vaporise the latter gas, one need employ only 0.22 of the heat necessary with the former. There are also two values for each different substance; one refers to the latent heat of fusion (*i.e.* melting), and the other to the latent heat of vaporisation. Of these the first-named, in accordance with the Kinetic Theory, is always the smaller.

The other terms used in connection with heat are well known; one British thermal unit, or B.T.U., is the amount of heat necessary to raise the temperature of 1 lb. of water by 1° Fahr. The number of these units required to cause the same rise in 1 lb. of any other substance is known as its "specific heat," and is generally less than unity.

Adopting the B.T.U., definite values can now be assigned to the latent heats of fusion, and vaporisation for each different substance, and by judging these values on the same basis as ordinary or sensible heat, their relative importance will be made clear. Taking the case of water, already discussed, the data necessary are as follows:—

| | |
|---|---|
| Specific heat of ice . . . . . | 0·50 |
| Latent heat of fusion . . . . . | 142 B.T.U's. |
| Specific heat of water (average) . . | 1·00 |
| Latent heat of vaporisation . . . | 966 B.T.U's. |
| Specific heat of steam . . . . | 0·48 |

Working from these figures the quantities of heat necessary for each operation may easily be calculated, as shown in the following table:—

| Physical Form of Substance. | Operation. | Nature of Heat Transferred. | B. T. U.'s Expended. |
|---|---|---|---|
| Ice . . | Heating, 0·32° F. | Sensible | 16 |
| | Melting at 0° F. | Latent | 142 |
| Water . | Heating, 32·212° F. | Sensible | 180 |
| | Vaporisation at 212° F. | Latent | 966 |
| Steam . | Heating, 212° – 244° F. | Sensible | 15·4 |

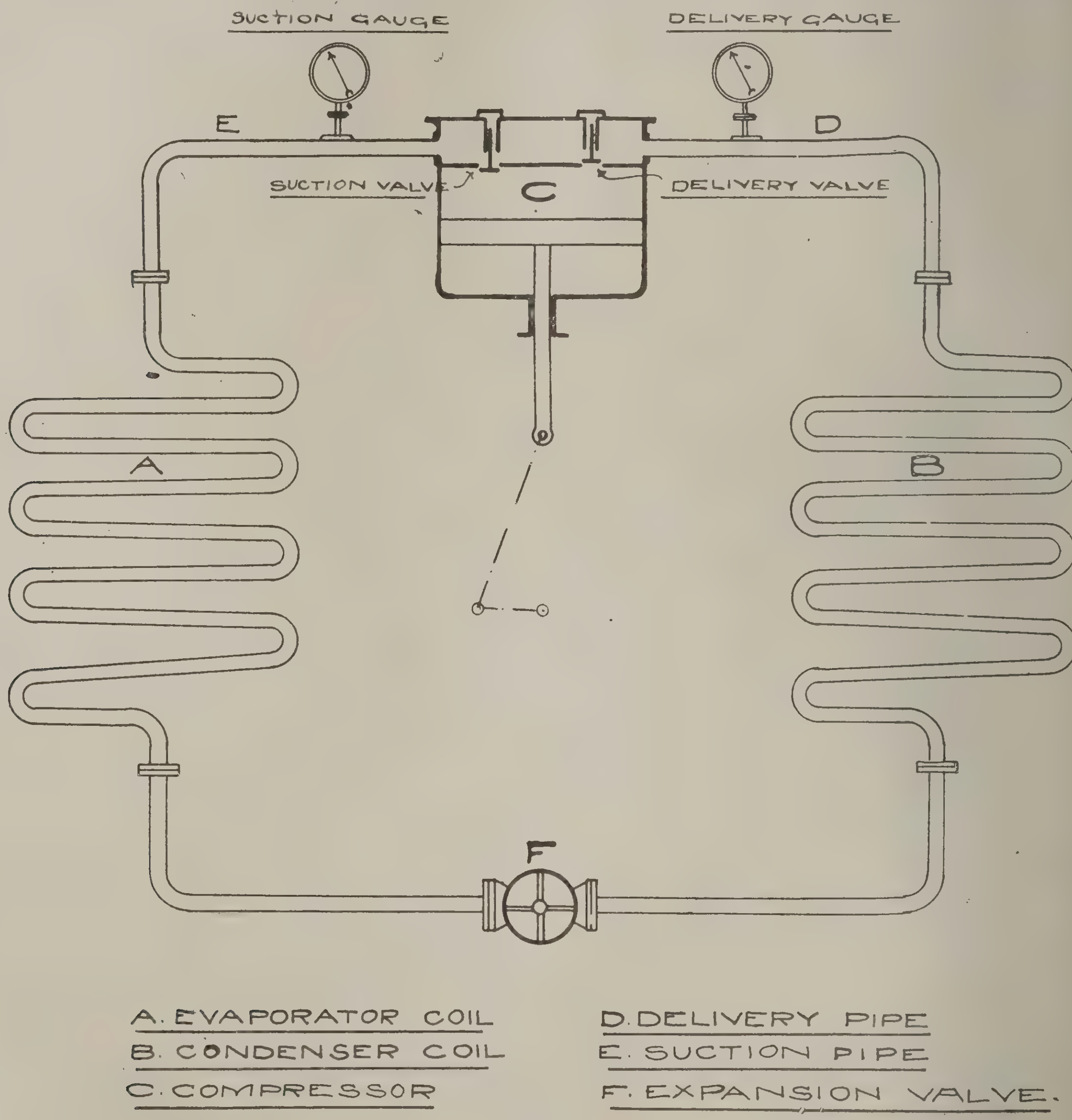


Fig. 11.

The super-heat of the steam has been taken at 32° render its sensible heat comparable with that of the ice.

The table clearly shows that each change of physical sta is accompanied by a large transference of heat. Such a tran ference, needless to say, is the sole aim of refrigeration, an the object of the vapour compression machine is to ensure i practical accomplishment.

The action of this machine, once the importance of late heat has been realised, will be found to be extremely simpl Its principal organs are shown diagrammatically in fig. 1 They are:—

A. Evaporating coil.
B. Condensing coil.
C. Compressor.
D. Delivery pipe.
E. Suction pipe.
F. Expansion valve.

The whole of this system is filled with a volatile substanc vaporous in some parts and liquid in others, which is know technically as the "refrigerant" or "refrigerating medium. That part of it which lies to the right of the compressor an expansion valve is maintained by the former at a high pre sure, which varies, according to the gas employed, from 9 to 35 lbs. per square inch. On the left hand of the centre li its pressure is much lower, and the limits are 380 lbs. p square inch, and zero (*i.e.* equal to the atmosphere).

Immediately to the right of the expansion valve the r frigerant exists as a liquid at the high pressure mentione The result is, that when the valve is slightly opened th volatile liquid spurts into the coil A, and is gradually evap rated at the low pressure there prevailing. During the proce each pound of the refrigerant absorbs a definite quantity latent heat from the surroundings of the coil, and in this wa these can be reduced to a very low temperature. The evap rating coil—which may be placed in a cold store, an ic making tank, or wherever the cooling is required—is ther fore the essential part of the machine, and its other co ponents may be regarded as necessary additions.

In fact, although the compressor, except in absorption plants, must always be used, a machine can be imagined where the condenser is entirely eliminated. Its place would then be taken by a limitless reservoir filled with liquid refrigerant at the required potential. The expansion valve would be fed from this reservoir, evaporation would proceed in the ordinary way, and the gas in the vapour form would be discharged into the atmosphere as waste from the compressor. Such a scheme is, of course, entirely impracticable, as the quantity of refrigerant used would be tremendous. The gas is, therefore, instead of being allowed to escape, compressed into the condensing coil C. Over the coil cold water is flowing continuously, with the result that, aided by the high pressure, the gas is gradually liquefied and arrives finally at the expansion valve, ready to begin the cycle afresh. In this way a continuous round of operations is set up, and theoretically one charge of the refrigerant would last for ever. Unfortunately the ideal is not realised in practice, as small leakages must always occur; but cases have actually been known, with low pressure machines, where the original charge of gas, without renewal, has been used for as long as three years.

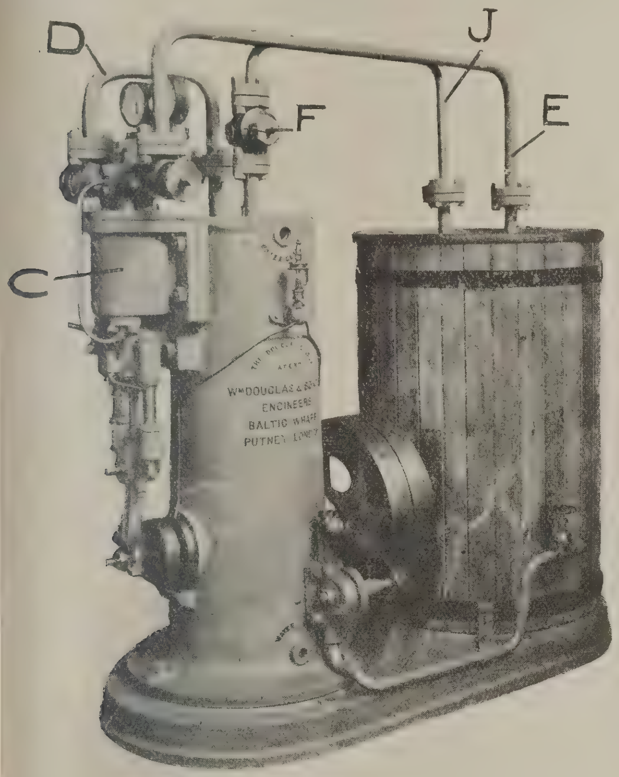


Fig. 12.

The function of the compressor is to maintain the evaporator and condenser at their respective potentials, and to keep the medium in movement round the circuit. At the beginning of the suction stroke an automatic suction valve opens and connects it to the evaporator by the pipe E. During the stroke a corresponding quantity of liquid is vaporised, absorbing the requisite heat, and exactly the same quantity spurts through the expansion valve to take its place. The compression stroke then begins, the suction valve closes, and, when the pressure has risen sufficiently, connection to the condenser is established by means of another automatic valve, and the delivery pipe D. A corresponding volume of the gas is then condensed in the coil B.

A strong analogy exists between the refrigerating machine and the ordinary water-pump. In the latter case water is pumped from a low to a higher level, and in the former, an exactly similar operation is performed, as it were, on heat, the varying levels being replaced by the evaporator and condenser temperatures. Heat is lifted, in fact, from a body at a low temperature (the goods in cold store for instance) to another at a high temperature (the cooling water in the condenser). On the strength of this resemblance the machine has been aptly named the "heat pump."

The practical forms of the vapour-compression machine are legion, but one of the simplest is shown in fig. 12. Here the evaporating coil is circular and is placed in a well insulated tank, filled with unfreezable brine. The condensing coil is similar in shape, and is inside the cast-iron tank seen on the left of the illustration. To one side of this tank is bolted the compressor C, and the driving pulleys which are to take the belt giving power to the compressor will be observed on the opposite side near the base. The cooling water is admitted at the bottom of the tank, and as it absorbs heat from the gas

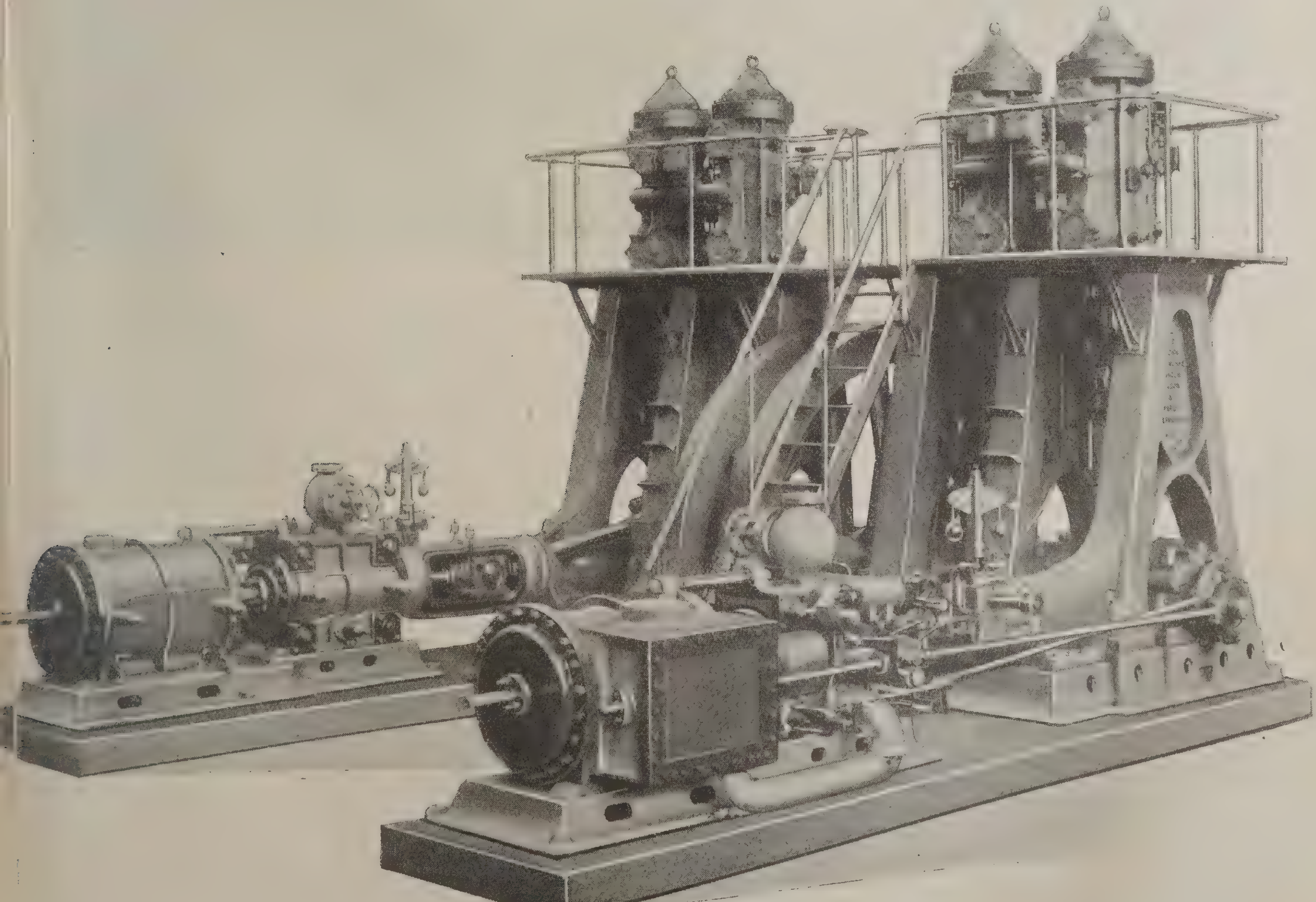


Fig. 13.

inside the coil, rises to the top and overflows into the outlet, thus forming what is known as a "submerged type condenser." Both condenser and evaporator are fixed to a common bed-plate, and the pipe connections are permanently fitted.

The path of the refrigerant is exactly as explained from the skeleton diagram. Leaving the compressing cylinder C at the pressure of the condenser, it passes through the automatic delivery valve, and is conducted by means of the delivery pipe D to the top of the condensing coil. There under the combined action of the high pressure and the cooling water it is gradually liquefied, and, arriving at the bottom, rises by the other leg of the coil to the expansion valve F. This is slightly opened, and the liquid, spurting through, passes by the liquid pipe J to the evaporator, where vaporisation takes place. The low pressure necessary for this operation (zero in the machine illustrated) is maintained by the suction of the compressor, which is connected to the top of the coil by the suction pipe E.

In this system the unfreezable brine contained in the evaporator tank is cooled to the desired temperature by the latent heat absorption into the gas, and is then circulated to and from the point, where the actual refrigeration is to be done, by the brine pump. For this purpose an outlet for cold brine is made in the bottom of the evaporator tank and connected to the suction of the pump. No inlet for the hotter brine returned is necessary, as this can be run in at the top, which is usually left uncovered. The brine pump can be isolated for cleaning or repairs by wheel valves, and the compressor by the shut-off cocks G and H.

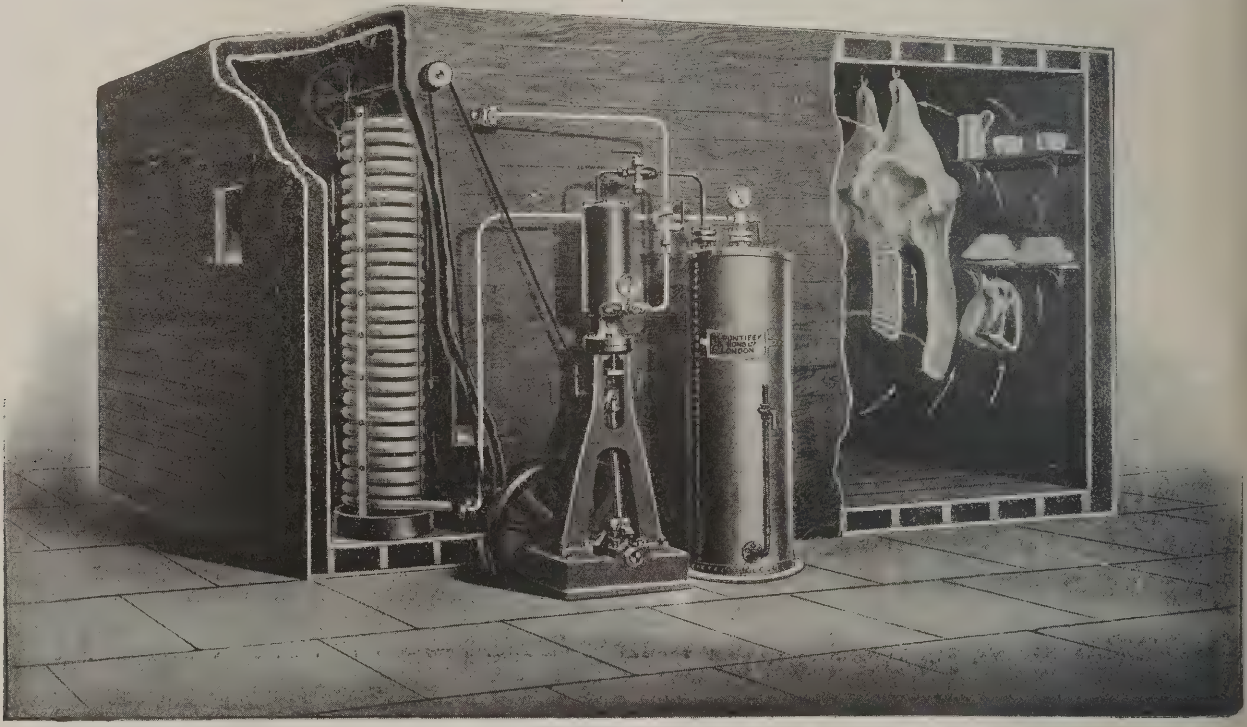


Fig. 14

This machine is one of small size by Messrs. William Douglas & Sons, Ltd., and the refrigerant used is sulphur dioxide. A larger compressor by Messrs. L. Sterne & Co., Ltd., working with ammonia, is illustrated in fig. 13. The four vertical cylinders seen are for compression, and the two horizontal cylinders form direct-driving steam engines. As far as motive power is concerned the plant is therefore self-contained, but the condenser and evaporator—or direct expansion pipes, as the case may be—are necessarily separate.

Evaporators.—The term "evaporator" is usually restricted to insulated tanks, such as that shown in fig. 11, which are filled with unfreezable brine and contain the evaporating coils of the machine. They are employed where it is necessary to have brine circulation, as opposed to direct expansion of the gas. These two systems have different uses, which will be indicated at a later stage, but at present it may be said that the former is employed chiefly for the direct cooling of such liquids as milk, yeast, and beer, marine work generally, and the maintenance of even temperatures in curing-cellars, &c. The brine itself is a solution in water of calcium chloride or chloride of sodium (ordinary salt), in the proportion by weight of 1 to 3. Such solutions have a low freezing point, and may therefore be reduced to low temperatures without fear of solidification. When made up in the above strength the calcium solution will register 34 on a Twaddell's hydrometer, or on the ordinary salinometer 92, and its specific gravity referred to water will be 1.186. For common salt th figures are respectively 38, 100, and 1,196. The freezi point in the first case is —8° F., and in the second zero.

The numbers just given are important, as it is essenti that the brine should never be allowed to drop below its prop density. Should it do so more calcium chloride or salt mu be added until the reading is correct; otherwise the freezi point of the solution will rise and solidification with co sequent blockage take place.

The evaporating coil is made of strong lapwelded tubin well stayed and supported. In larger machines several co centric coils and very often more than one tank are employe distribution from the liquid pipe and collection to the sucti pipe being effected by suitable headers. The tank itself is wrought iron, coated inside with bitumastic paint, and should be insulated with from five to six inches of cowha or silicate cotton, packed between suitable ground pieces a sheeted with a double layer of narrow matching.

Direct Expansion.—The feature of this system is th the cooling effect instead of being transmitted through intermediary, such as brine, is applied directly at the poi where it is required. In this way the evaporator is elim nated, and the vaporising coils, in the case of cold store, f example, abstract latent heat for the gas inside of them fro the air and from the goods themselves. They are no long circular, as in the evaporator, but assume a large variety different forms, according to the disposition of the roo cooled. In some cases they are arranged in grids on the ce ings and walls; in others they are built in stacks, over whi the air is driven by a fan. The system is thus very flexib and its only disadvantage is that there is no accumulati of "cold" such as is attained with brine. At a late sta the significance of this remark will be more fully appreciate

A room cooled by direct expansion is shown in part secti in fig. 14. A circular coil is used over which air is driv by a fan, and continuous circulation is thus established the direction of the arrows. The plant is by Messrs. Pontifex & Sons, Ltd., and their compressor and submerg condenser are seen outside the chamber. Suitable pipe co nections are made to carry the ammonia, which is the frigerant used, and its path throughout the system will easily followed. It differs from the sulphur dioxide pla already described only in the arrangement of the suction pip which is carried to the bottom of the compressing cylind instead of to the top.

It should be noted that the circular coil shown is by means the best for direct expansion cooling. A flat coil wou distribute the air more uniformly and allow of a better shap room. At the same time the coil, of whatever form, shou stand in a tank of brine in order that "cold" may be stor up to be given out when the machine is not running. Th arrangement, with others, will be discussed under "Metho of Cooling."

*(To be continued.)*

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the last meeting of the Royal Institute of British Architects, on January 31, Mr. Mervyn Macartney ead the following

### Criticism of Drawings submitted for the Institute Prizes and Studentships, 1909-10.

I feel deeply honoured in having been invited to review he works submitted for the Institute prizes and studenthips. It is a privilege as well as an honour; but priviieges, to be worth anything, are generally hedged round with duties, and so it is in this case. To discharge conscientiously this task is no light matter, especially for one, ike myself, who has never entered any of these contests. I have never heard "the bells chime at midnight," nor have I racked my brain for recondite mottoes like "Touchsoane." There is this much to say for these competitions, that I firmly believe that they are awarded by the judges without fear or avour to the design or drawings considered best. I feel ertain that your tribunal is absolutely impartial; and this act must be of enormous value to you when entering these ists. It mitigates the soreness of defeat to know that you have lost because a better man has won. On the other hand, nothing discourages a man more than the feeling that he has been unjustly dealt with, especially when he is young and has not had any experience of the world's wicked ways. We should all be happy to stand in the shoes of the winners, and set out on our travels through the enticing lands which history points out as the birthplaces of our art—to Italy, to Greece, to France, or, less distant, to wander through our own land with all the blithe carelessness of youth, the enthusiasm, the whole-hearted devotion to art. And to those who have failed I would say, you can at least hope to follow them later. Although your work in the present nstance has proved unsuccessful, it will surely, by the experience, by the increase to your knowledge, help to make you cultivated architects. It will do that at the very least; t may also lead you to victory another time.

But, after all, the reward is his who has through months of self-denial carried to completion a definite and difficult piece of work. And the feelings of Gibbon on relinquishing his pen after his labours on "The Decline and Fall of the Roman Empire" are not very dissimilar to those of the weary student who lays down his pencil with his last drawing finished.

I may be allowed to say a word on the value of these competitions. As you all know, architectural education at the Beaux-Arts is almost entirely a matter of "concours," and those, too, of a magnitude that would make most of us greyheaded; but you also know with what results. The great American schools do no less, and their recent achievements are no less astonishing. There may be some disadvantages in this system of education, but they seem to me counterbalanced by its obvious advantages. Apart from the effect on the student of competing with his fellows, and learning from his blunders, and getting rid of all the nonsense he may have imbibed, it prepares him for the wider strife of his later life. Most public buildings nowadays are put to competition, and offer to the young man unequalled opportunities of displaying his ability. I may remind you, too, that it has nearly always been the same; you all know that Brunelleschi was unsuccessful in a certain competition for bronze gates, and yet lived to crown St. Mary-of-the-Flower with a great dome.

It is sometimes objected that these competitions are too academic in character, too much removed from everyday practice to be of much use to the student. From this view I entirely dissent. The exigencies and shifts of real practice will come soon enough, and these academic exercises, while teaching design, give to the intellect an agility to be acquired in no other way; and therefore I congratulate all students whose courage has successfully carried them through a long and arduous undertaking.

Two main branches of work have to be considered—studies of ancient building and original designs. Too much stress cannot be laid on the utility of the first of these studies. In no other way can the student learn to understand architecture as a thing of three dimensions—a thing solid and stable like the rocks and hills; a thing, like these, to stand through years and centuries exposed to the ravening teeth of time. This is one of the most useful lessons the student can learn—that architecture is not paper. By studying ancient buildings he will learn to understand the weights of architectural features, their values. If he analyses the impression made on his mind by a building, he will discover the qualities that made for sound architecture—repose, dignity and unity. However much he is interested in detail, he will find that these are like notes of music, serving merely to build up some grand symphony of sound.

The greatest thinker of the eighteenth century, one whose mind like the very sun irradiated everything, likened architecture to "frozen music." I like this simile, for it seems to crystallise in two words all criticism of great architecture. And no one who has been moved and delighted by some fine building will, I think, be inclined to doubt its truth. So that the student should try to discover the vital qualities in the building he chooses to delineate, and pay more attention to the masses than to the details which only help to build up the main conception. In his drawing out he should endeavour to be as clear and concise as possible, trying to express the spirit of the work—as far as this can be done by geometrical drawing—rather than his own idiosyncrasies.

With the original designs, clear and simple draughting should be striven for. But this is secondary to the design, and the student before entering this phase of his work should have made himself quite clear as to the requirements of the programme. From this brief premise let us pass to a short review of the work itself which has been submitted in the present instance.

The drawings as a whole are not of transcendent excellence. Indeed, I consider that, taking them *en masse*, they are below the average. There are some good examples of draughtsmanship and colour, but they are few. There is little unanimity in the rendering of drawings, which, by the way, adds considerably to the difficulty of judging, and points to the fact that there is at present no definite teaching in this country. There are almost as many styles of drawing as there are candidates. Some are in the French style, but they lag far behind the real thing; others are done in a slap-dash "Art Nouveau" with a Teutonic touch that is rather amusing.

The good old-fashioned type has still its followers. Originality has a certain charm, and has the additional, questionable advantage of attracting attention. This is notably the case in the design "Horseshoe," awarded the second prize in the Soane Medallion competition. But it would be impossible to live in the same house with that perspective.

Now, if one looks at the drawings collected at the Victoria and Albert Museum, one is struck by the sobriety and dignity of the exhibits. There is no attempt to advertise the cleverness of the draughtsman. It is good honest work, and attempts only to render truthfully what it set out to do without any *arrière pensée* of applause. It may be said here that this quiet unobtrusive draughting requires more skill and patience than the slap-dash method. Perhaps the extensive use of perspectives is the cause of this anxiety to shine. Personally I instinctively decline to be drawn by the alluring and meretricious. I should recommend students to leave out all unnecessary details, such as figures and motor cars—the guardsman and nursemaid seem to have had their day, but other figures as ill-advised and as badly drawn have taken their place, which always remind me of the blind man's remark in the New Testament that "he saw men as trees walking"; and as for the motors—no self-respecting inspector would give them a licence.

Taking the awards as they appear in the Institute *Journal*, we have the measured drawings first. The first prize is awarded to the author of a set of drawings showing the Wellington monument, "Roma." The details are beautifully drawn, but the half-inch drawings are less attractive. They lack crispness and decision, but on the whole they make a useful set, although below the average of other years.

The drawings placed second, "François Mansart," are remarkably good. His subject is the Hôtel Carnavalet, Paris, and if the large-scale drawings had been up to the standard of his small drawings it would have come into more serious competition with the winner.

"Adige" was placed third, with drawings of the Palazzo Pompeii and Palazzo della Gran Guardia Vecchia, Verona, but his execution lacked crispness and did not rise to his high theme.

Two sets of the West Front of St. Paul's were submitted, both conscientiously drawn. Those by "Puggins" are extremely accurate, and I would impress on students the necessity for absolute correctness. Another set shows Christ Church, Spitalfields—a rather gaunt looking subject when shown in grim outline of black and white. This last competitor would be well advised to consult the conditions more closely in future. He will find that six strainers are required, and if his drawings had been adjudged the best he would have been placed *hors concours*.

The next prize on the list—the Soane Medallion—is the most important, and although the subject of the competition was an inspiring one, it has not called forth any great merit. The fault lies to some extent in the conditions themselves, as perhaps the boundary of the site was too confined. However, the first two designs are good. The first, "Mirth," is a good sober study of Renaissance work, very well worked out, but indifferently drawn; a serious omission in the plan is the absence of a foyer. The perspective, however, does justice to the design; indeed, it is quite the best in the exhibition. The second, "Horseshoe," is an extremely clever design, but I fear in execution its crowning feature would be lost. Its clever perspective has been mentioned above. "Sunlight and Air" submits a design worked out with a French flavour. The effect in perspective is not quite happy. An imaginative study, cleverly rendered, is drawn by "L'Espoir." "Mafie's" drawings are extremely interesting, but the design fails as a whole. If it is allowed, I should recommend the author of "Budget" to retire quietly into political life.

Three sets of drawings were submitted for the Owen Jones Studentship, and the prize is awarded to Mr. W. O. Miller, whose work deserves great admiration, but it is regrettable that he did not choose a better illustration of modern work than the façade of the church of SS. Pudentiæ and Pudentianæ at Rome, the front of which has been covered in modern fresco decoration in imitation of mosaic. I endorse the recommendation that the sets of strainers submitted by Mr. H. R. Wilkinson should have some award. Mr. Gibbons should be commended for the most painstaking and careful drawing he has made of the Italian mosaic pavement from the Presbytery of Westminster Abbey, especially as the whole was drawn and coloured on the spot.

The drawings submitted for the Pugin Prize are on the whole very good. Mr. Hubert Frazer, who is awarded the prize, has an excellent variety of drawings clearly and well done. The two gentlemen, Messrs. Chisholm and Cowper, bracketed for second place have also done good work.

Thirteen competitors submitted designs for the Tite Prize. There seems to have been some misconception in their minds as to the kind of loggie best suited to the site. Here, again, if we may say so, the conditions were faulty. One has only to consider the size of the sunk garden—actually about one tenth of the area of Lincoln's Inn Fields—to see this. In spite of this confined area the bulk of the competitors choose to shut it in with raised loggie, which in reality would have a poor crowded effect. None of the designs was considered to possess sufficient merit to warrant the prize being awarded, and it is therefore withheld. The most meritorious scheme, "Jupiter," offers no obstruction. The sunk space (it cannot be called a garden) is surrounded by a terrace raised a little above the level of the street, and the corners are marked by raised shelters—quite a needless addition. His drawing is only fairly good, and his perspective is bad. "Tomahawk," placed second, has no obstruction opposite the palace, although he has surrounded the other three sides with screens. The triumphal arches at the sides are too heavy and quite out of place. "Comprised Within" is placed third, with a rather careless set of drawings. The perspective is the best of them. Most of these drawings are very much below the usual standard of the work in this competition.

Mr. C. D. Carus-Wilson is awarded the Arthur Cates Prize for some excellent drawings. His design for a country house is also good, at least as far as the exterior is concerned; the plan is poor. Mr. William Dean is commended for his drawings of the staircase of Cromwell House, which are extremely vigorous and crisp.

The Grissell Gold Medal is awarded to "Fra Angelico" for a fairly good study of a church in ferro-concrete. His competitor is commended for his constructive ability. The architecture is of a nondescript and futile character, and the perspective distinctly poor. Mr. W. Milburn, junior, has been awarded the Godwin Bursary in view of the convincing nature of his essay and knowledge of hospital work.

In conclusion I should like to say one word more to students. I have said above that the task of the judges is made extremely difficult by the fact that the drawings are finished in every conceivable style—shadows projected on plan till the scheme is hidden, others coloured like a kaleidoscope, and elevations treated in a hundred different and confusing ways. I should recommend students to alter all this and to finish their drawings simply in pen and ink, and to figure titles, names of rooms, &c., in legible and fair Roman lettering. I hope to see this embodied as a definite requirement in the instructions to competitors in the future. When a perspective is required it is obviously useless to project shadows on elevation. Do not imagine that it is easy to make a fine set of drawings i pen and ink—far from it; but it is by far the clearest and bes way of exposing a design.

Professor Reginald Blomfield, A.R.A., proposed a join vote of thanks to the President and to Mr. Macartney fo his critical notes. He hoped every student would read an re-read the President's address. It was direct and sincere kindly and sympathetic, and ought to be considered as sort of pilgrims' scrip. The only point he questioned wa the one in which reference was made to games, with quotations from Sir William Richmond and Mr. Rudyar Kipling. Speaking as an Englishman, Professor Blomfiel said the objection to sport proceeded from a misapprehension of some of the qualities of the English race. They hear too much of the professional man, and he did not think the could afford to lose sight of that splendid ideal of the Greek which combined intellectual attainment with perfection o the human form. In referring to Mr. Macartney's criticisms, he said he considered the gentlemen who framed th conditions of the competitions did not give sufficient elbow room to the designers, though it was perfectly true in regar to draughtsmanship that the English methods neede standardisation. He could not agree that this year's wor was not up to the average, and believed it to be well up t the standard of other years.

Sir W. B. Richmond, R.A., seconded the motion, an asked to be allowed to congratulate the Royal Academy o Mr. George's election to that institution, and he hoped th time would come when they would have more architects i its membership. He agreed entirely with the strictures th President had made upon games, but he believed in them As a young man he had joined in sport, and was therefor perhaps better able to judge of its dangers, for it involve a tremendous amount of wasted energy. Referring to th colouring of Greek architecture, he said the colours the used were not the same gaudy tones that would be use to-day, for the Greeks were too great lovers of form to us aggressive colours; and he maintained that architecture however pure, however exquisite in treatment and refine in design, was not injured, and could be enormously improved by a judicious use of colour.

The President then distributed the prizes and studentships to the successful competitors, the full list of whom was published in *The Architect* of January 21.

It was announced that a special general meeting woul be held on Monday evening next, February 7, to consider th revised regulations for architectural competitions, and als to sanction the alterations in the by-laws recommended b the Privy Council and the solicitors of the Institute.

## ILLUSTRATIONS.

### DODFORD CHURCH, AND "THE TOWER," FROM THE NORTH-WEST

THIS view shows the connection of the church and the house at Dodford, of which Mr. Arthu Bartlett is the architect.

### CATHEDRAL SERIES, LLANDAFF.—THE CHOIR EASTWARDS.

WE give this week a view of the interior of the choir looking eastwards.

### THE CHAIN GATEWAY, WELLS CATHEDRAL.

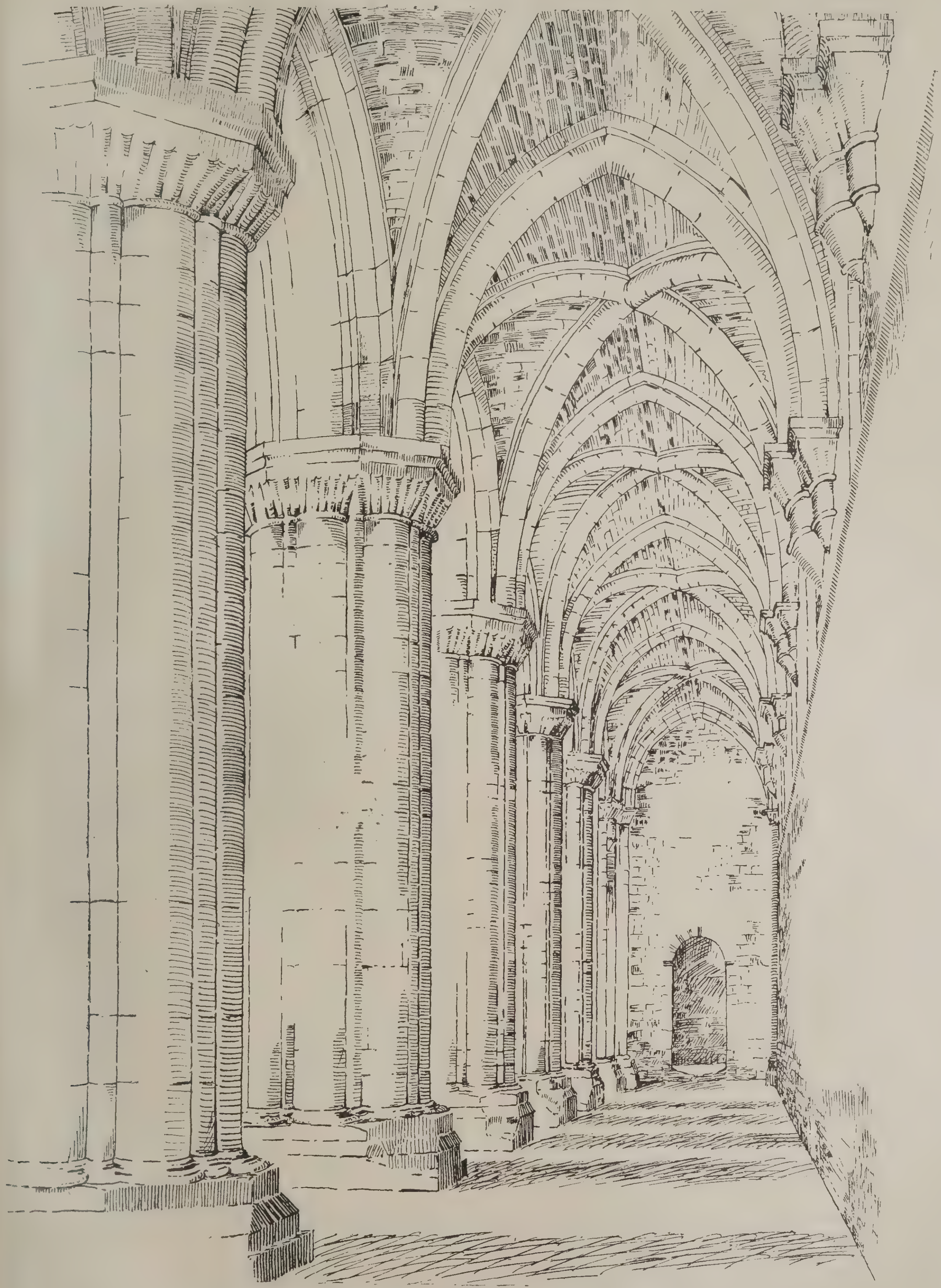
THIS week we present the section in the series o measured drawings by Mr. Westbye, which wil be completed in our next issue with some large scal detail of the mouldings.

## COMPETITIONS.

Bromley (Kent).—The following architects have bee invited by the trustees and managers to submit designs in limited competition for public elementary (Church) school to be erected at Mason's Hill, Bromley:—Mr. H. W. Burrows, Mr. Evelyn Hellicar, Mr. H. R. Latter, Messrs Russell & Cooper, Mr. C. H. B. Quennell. The assesso appointed is Mr. H. P. Burke Downing, F.R.I.B.A., o 12 Little College Street, Westminster Abbey, S.W.

London.—The design of Mr. James Miller, A.R.S.A. architect, Glasgow, has been selected for the new premises o the Institution of Civil Engineers, London. Some month ago the Institution invited six firms of architects to compete each receiving a premium of 200 guineas. The scheme wil involve an expenditure of over 100,000*l*. The site is in Grea George Street, Westminster, near the entrance to St. James' Park.

## "THE ARCHITECT" 'STUDENTS' SKETCHING AND MEASURING CLUB.



THE SOUTH AISLE, KIRKSTALL ABBEY.—Prize Drawing for January by "ESEK."

KIRKSTALL ABBEY was founded about 1152 A.D. by one HENRY DE LACY, and was erected by Cistercian ionks—the plan being typical of the Order—who came om Fountains Abbey, Yorkshire. It is interesting to ote in passing that when this HENRY was persuaded or ecided to lay the foundation of an abbey he consulted e Abbot of Fountains about 1145, and gave land at arnoldswick, near Skipton, for the purpose.

Twelve monks and twelve lay brethren were sent out and erected some buildings (probably consisting of presbytery and monks' and lay brethren's quarters), which they occupied for about seven years; but times were troublesome, and they were so continually harassed by lawless bands that they eventually pulled down the buildings and returned to Fountains.

Some time later the abbot in charge of these monks visited Airedale, and thought Kirkstall a suitable site, so Henry de Lacy arranged for the land with the Duke of Norfolk, and the present ruins show what a great work was accomplished. The plan is very wisely arranged: a cloister court with buildings around, the abbey on the north, chapter-house and monks' quarters on the east, lay brethren's quarters to the west, and refectory, kitchen, &c., to the south. The infirmary and abbot's lodging are to the south-east, and connected to the cloister by passages.

The first portions to be built were the presbytery, kitchen, refectory, monks' and lay brethren's quarters; then part of the chapter-house and nave and transepts. This part of the chapter-house was evidently built before the nave and aisles, as semi-circular vaulting ribs are used diagonally and transversely, while in the aisles pointed arches are used transversely.

About the end of the twelfth century the kitchen was enlarged, and refectory turned with its short sides north and south.

In the early thirteenth century an addition was made to the chapter-house, especially interesting as it shows the confidence and experience gained in vaulting, the whole span being covered without intermediate supports. About this time a portion of the abbot's lodging was built and part of the infirmary, both being completed and connected to the cloister towards the end of this century.

In the fourteenth century little was done beyond quarters for visiting abbots.

A new east window covering nearly the whole of the east wall of the presbytery was inserted in the fifteenth century, but no tracery remains. The tower was built prior to the suppression of the monasteries, and it is supposed that the monks, in anticipation of this suppression, built the tower to dispose of their accumulated wealth. In any case it appears to have been erected without much thought, as the foundations were not designed to carry such weight, and consequently collapsed.

The elevations are treated in the simple Romanesque style, with little ornament except to the doorways, yet the grouping of the various parts is so arranged that it gives a sense of dignity and grandeur to the whole conception.

## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at the premises in Tufton Street, Westminster, Mr. H. Tanner, F.R.I.B.A. (president), in the chair.

Messrs. E. C. Hallett, C. G. Simmons, P. Streitberger, and L. W. Baker were elected as members.

The President announced the third spring visit, fixed for February 12, to the new Y.M.C.A. building in Tottenham Court Road, by kind permission of the architect, Mr. Rowland Plumbe. Members to meet at the building at 1.30 p.m. A visit will afterwards be paid to the British Museum extensions at 2.30 p.m., by kind permission of the architect, Mr. J. J. Burnet.

The President said at the next meeting of the Camera and Sketching Club, on February 17, at 7.30 p.m., Mr. Michael Bunney would read a paper entitled "Georgian Architecture."

Mr. W. H. Ward read the following paper, illustrated by lantern views, entitled—

### Renaissance Church Architecture of the Sixteenth Century in France.

France in the sixteenth century, he said, offers the picture of the union of two architectures, so different in their aims and in their forms as to seem irreconcilable. Yet, as is often the case in a marriage between persons of strongly diverse characters, the union was not unhappy in its results, each party to it supplying elements which are lacking in the other. The products of the combination are so rich, so vigorous, so varied, and their development, though so often baulked by events, so rapid, that few more fascinating studies can be found in the history of architecture, and it will repay perhaps more than is usually thought to push the study even into such bypaths of the subject as that which forms the theme of this paper. It is a commonplace that the history of architecture is in most countries and ages the history of religious architecture. In the Middle Ages if church architecture were eliminated, nothing coherent, or indeed very important, would be left. But, at the time of the Renaissance, western Europe had largely outgrown the tutelage of the Church, the hitherto all-embracing institution, the all-pervading medium in which its life had moved. The idea of nationality was developing, and in England, Spain, and France the focus of national life was becoming a strong centralised monarchy. The architectural expression of this state of affairs is to be found, therefore, in secular building, and more particularly in the dwellings of the Sovereign and his court. The architecture of France in the sixteenth century is essentially an architecture of châteaux, of the pleasure-houses of a still half-feudal aristocracy. Church architecture is thus a bypath, but a pleasant and withal an instructive path to trace out.

Since, for brevity, it is convenient to indicate phases of style by the names of kings, I will at this point define the sense in which I use these names. The Louis XII. style is the transition from Gothic to Renaissance, in which elements from both schools are intermingled capriciously and without system; the Renaissance elements are chiefly decorative, and do not affect the structure. The Francis I. style corresponds with the Early Renaissance of Lombardy, which supplies its graceful and exuberant decorative system, but the structure is still in essentials unchanged. The Henry II. style corresponds with the advanced, or Roman Renaissance, which not only brings with it a more masculine code of forms governed by stricter rules, but usually exerts an influence on the design as a whole both in plan and elevation.

These definitions apply to all branches of architecture, but in dealing with church work further distinctions must be made. First, when the Francis I. style was fully established and its detail thoroughly understood, Gothic ideas persisted in the Church in conjunction with it far more than in secular work. Thus, for instance, the occurrence of a pointed window in a château would generally be sufficient for it to be classed as Louis XII., but in a church it might be found at any period almost up to the eighteenth century, and would be treated in contemporary detail. Secondly, the term "Henry II. style" may, more especially in church work, cover two very different classes of design; one, in which the influence of the advanced Renaissance is confined merely to a use of the Orders and a mode of profiling more correct according to contemporary Italian standards, and another in which the whole building is designed on Classical lines.

It is much more difficult to present a picture of church architecture in the sixteenth century than of contemporary secular architecture, because there is no large number either of extant buildings, of illustrations of destroyed ones, or o unexecuted designs, and, what is worse, no consecutive series of complete examples at all. If we except a short list o approximately complete buildings, a history of the style mus be compiled chiefly from additions and embellishments t Gothic churches—here a chapel, there a transept, elsewhere a vault or a portal, a tomb, a screen, or a reredos. We can but guess at the manner in which an architect of the second or third generation of the Renaissance would conceive a entire church, while the buildings of the first generation ar so few that the possibilities of style development which they seemed to promise were never fully worked out.

Yet if we examine the conditions under which this wor took shape, we shall be surprised that so much rather than s little was accomplished. If we consider the state of th Church, we see that, while politically she was increasingly subject to the civil power, morally as well as intellectually she was no longer the only, perhaps not even the principa leader. She might, however, have yet played an importan part in the pageant of architecture but for two circumstance —the building activity of the Middle Ages had left th country amply equipped with places of worship, and th internal condition of the Church was far from satisfactory The first of these propositions needs no amplification. Th second is shown by the fact that French Catholicism produce during the sixteenth century no conspicuous saint or theo logian except such as had leanings towards unorthodoxy. Th clergy were permeated with worldliness and superstition, an the most prominent churchmen were chiefly distinguishe either for secular learning and political ability, or for thei persecuting zeal. Meanwhile the operative forces of religiou life were, on the whole, to be found among the Reformers who were being forced by the prevailing repressive policy t form themselves into independent organisations. This stat of affairs was only temporary. In the seventeenth century when the counter-Reformation had done its work, the Frenc Church entered upon a new period of progress, and wa second to none in the piety, zeal, and learning of her divines. In the sixteenth, however, she had neither the need nor the moral impetus for building on a great scale.

If we turn, on the other hand, to the nascent Reformed churches, we find them even less favourably situated. The Reformation was not refractory to classical influences, and, at any rate, in its earlier stages went hand-in-hand with Humanism. Their architecture would thus naturally have assumed a Renaissance colour. But till the time of Henry IV. Protestants never received more than the barest toleration, and seldom even that. At the same time their numbers were smaller and their needs simpler than those of the Catholics. In rare cases existing churches were assigned to their use; more frequently they had to be content to meet in private dwellings, in buildings lent by some nobleman "of the religion," or in the open air, happy if their devotions were not disturbed by bloodshed. Some places of worship were erected *ad hoc*; others arranged by fitting up secular buildings, such as barns, with galleries. All were swept away by one or other of the contemporary bursts of fanaticism, or, at latest, did not long survive the Revocation of the Edict of Nantes (1684). There appears to be but one exception extant—a graceful Renaissance edifice in the abandoned city of Les Baux in Provence, which was probably erected as a Protestant chapel. The reaction against ceremonialism and superstitious practices naturally generated an iconoclastic spirit, under the influence of which buildings and their adjuncts associated with the Roman cult suffered at the hands of zealots. The period of civil and religious strife in the latter portion of the century was, in fact, a destructive rather than a creative one.

It has often been remarked that men are most conservative in matters of religion; in this respect architecture is no exception, and mediæval methods died hard in France. On general grounds it was to be expected that the resistance to a classic revival would be strongest in the cradle of Gothic art. More especially would French church architecture, whose development had been the inspiring idea of Gothic art, be its last stronghold. Accordingly, we find that side by side with the new tendencies pure, or all but pure, Gothic designs persisted in much church work of the first half of the sixteenth century. Some parish churches and large portions of several of the cathedrals commenced under Louis XII., and not finished till the reign of Henry II., are cases in point. Even beyond this period, when Renaissance forms had become as firmly established in religious architecture as elsewhere, sporadic instances of Gothic design are by no means rare. St. Merry in Paris (1520-1612) shows hardly a trace of them. The Gothic cathedral of Orleans was only begun under Henry IV., and its pseudo-Gothic west front not built till the reign of Louis XV.

As in secular architecture, the Renaissance movement spread from the top downward. The most strenuous opposition to innovation would seem to have come from the conservatism of the craftsmen specially attached to the service of the Church and trained by hereditary traditions of construction and technique, and from the lower clergy, often poor, ignorant, and superstitious. On the other hand, the heads of the profession, the great master masons of the cathedrals, seem to have been ready to accept hints from Italy. Thus Martin Chambige and Rouland le Roux, both members of dynasties of "maîtres des œuvres," who carried out important works, the former at Sens and Beauvais and the latter at Rouen, introduced Renaissance elements into them, or allowed the craftsmen under them to do so. Similarly the heads of the Church—that is, those among the clergy who were most open to new ideas—were just those who came most in contact with Italy. The relations between the French Church and the Holy See produced a constant interchange of visits. French clerics of standing usually journeyed at least once to Rome, and great political churchmen, such as the Cardinal of Amboise, the builder of Gaillon, and his nephew, or Cardinal Ippolito of Este, passed continuously to and fro. Again, French benefices were a convenient provision for Italian younger sons and "nephews" of popes and cardinals; these prelates often considered their duties discharged when they had drawn the revenues, but the personal belongings and church paraphernalia of those who did reside would be a revelation to their French neighbours, even when they did not directly introduce Italian artists or architects.

The field of possible Renaissance influence in church architecture is thus confined to the relatively small amount of work undertaken by Catholics, and a portion only of that. Church building was no longer a popular enthusiasm. Though it was occasionally paid for out of municipal funds, or by public subscription, it was more often due to the bounty or vanity of the rich. Nobles, lay and ecclesiastical, officials or wealthy "bourgeois," would provide a parish in which they were interested with a new church, or build themselves a private chapel or mausoleum. The bishops had lost the taste for lengthy constructions, and preferred to undertake something of moderate compass, which they might hope to see completed in their lifetime, such as a steeple, a doorway, a set of screens.

The comparative rarity of examples may account for the unfamiliarity of the subject; and this unfamiliarity may be partly responsible for the contemptuous manner in which the few examples generally known, beautiful as they are, have too often been dismissed as grotesque freaks or necessarily unsuccessful attempts to compass the impossible. To the structural appropriateness of classical forms there is often ground enough for objection, but it should not be forgotten in estimating at least French and Italian Renaissance churches that a possible evolution, such as that which took place in the Middle Ages, was arrested by foreign invasions, civil wars, and other disasters before complete assimilation could take place.

But the hostile attitude alluded to is also partly due to an assumed antagonism between classical forms and Christian worship, a view which seems to ignore the fact that all Christian architecture derives ultimately from a classical source, and that the nearer it is to the age of primitive Christianity the more classical it is. A High Church lady once told me that she could not worship in Marylebone parish church because it was so like a pagan temple. Could she have been transported to the second or third century she would have found no place fit to worship in at all. In the sixteenth century few educated people would have shared her opinion. The introduction of allusions to classical mythology is also freely condemned; but even here, grotesque as they may appear to us, it is hardly extravagant to recognise manifestations of a wider outlook on history which the recovery of a knowledge of antiquity brought with it. At a period when the subtlest minds were striving to harmonise ecclesiastical and pagan conceptions of the universe—a task with which Dante had busied himself two centuries earlier—when Marsilio Ficino was attempting to reconcile the philosophy of Plato with the teachings of Our Lord, when Leonardo da Vinci was painting John the Baptist with the attributes of Dionysus, these heathen allusions did not shock the faithful. All antiquity was in their eyes a part of the divine plan of the world's government, and equally available with the Scriptures and the lives of the saints for the illustration of moral and theological truths. Parallels were found without difficulty—Hercules with his club figured side by side with Samson and the ass's jaw, amorini were hard to distinguish from cherubs, satyrs from devils, or the queen of the gods from the Queen of Heaven. The ancients might have been pagans, but it was quite possible, "avec un peu de bonne volonté," to believe that their mythology was but an imperfect foreshadowing of Christian doctrine, and since in other things there was so much to be learnt from them, allowance might be made for the moral shortcomings of their divinities; in any case they were quite as edifying as the broad jests with which irreverent mediæval sculptors had decorated gargoyle and miserere. The Renaissance sculptor may have been pedantic when he represented God the Father with the attributes of Jove the Thunderer, but he was conscious of no more incongruity in doing so than the artists of the catacombs who portrayed the Saviour in the guise of Orpheus. It must not, however, be supposed that pagan elements, as distinct from definitely architectural forms, played a leading part in the decoration of churches. Everywhere scriptural and hagiological subjects predominated, together with emblems illustrative of theology and worship; they were merely expressed in a new manner.

Whatever view may be taken of the reimportation of classical forms into church architecture, there can be no question that it was inevitable. No institution forming a vital part of national life can remain unaffected by its intellectual environment, and church builders had to assimilate the humanistic tastes which were permeating the whole of educated society. In doing this they were confronted with the same problems as the castle-builders—the clothing of a mediæval framework in a modern dress; but there was this difference, that whereas in the castle the reason of its being—its fortification—was growing obsolete, and some semblance of it was retained only from habit and for sentimental reasons, in the church the functions were unaltered, and no change in essential arrangements was tolerated.

The architecture of the Church was thus, like all contemporary architecture, a compromise between French and Italian methods. It differed in retaining throughout a larger proportion of the essentially native element. The great interest in studying it is to trace out the way in which the builders set to work to translate traditional details, features, and types of composition into a new form-language as fast as they learnt it. It is curious to observe to what different results these attempts led; not only how they differed from decade to decade, but how simultaneous attempts differed from each other. This is due to differences not so much in the taste as in the cast of intellect of the designer. A man with an aptitude for grasping the grammatical principles of a language, but a poor head for vocabulary, will soon know how to construct sentences in a foreign tongue, but will have to fall back on his own for words. He is, however, a less common type than the man who can pick up words parrot-like and learn to speak a foreign language, fluently perhaps, but ungrammatically. Thus, in architecture we see more examples of rapid advance in forms keeping pace with the changes in fashion, but employed to express old types of design, than of a quick grasp of new general principles of design; and when the latter occur they are not always up to date in detail.

I hope to illustrate by slides some of these stages of development, together with others of an intermediate character. In the course of these translations we shall see some merely curious, or even grotesque results; but, on the other hand, many charming and ingenious ones, full of suggestion even to-day, which may well fill us with regret that various causes, and in particular the Wars of Religion which raged for thirty years in the latter half of the century, should have arrested the course of development, and that when development began again in the reorganising era of the seventeenth century it should have been inspired by quite another order of ideas.

(*To be concluded.*)

## THE JOINER'S CRAFT.*

### *General Introduction.*

THE subject chosen for me to address you upon to-night is that of the joiner's craft. When this subject was communicated to me I confess I accepted it with considerable pleasure, for if there is one thing that interests us all it is English woodwork, upon which we, as a nation, pride ourselves.

But when I found that my lecture was to be preceded by a lecture on carpentry it at once became necessary to consider how much of English woodwork strictly belonged to carpentry and how much to joinery.

Of course, the whole of the woodwork of mediæval times belongs to the carpenter; the term "master carpenter" is quite frequently met with, and there is no mention whatever of the joiner. I came to the conclusion, however, that I could safely go back to the beginning of the time of Elizabeth.

Then, in the course of my researches I came upon the record of a controversy which took place about two centuries ago between the members of the Carpenters' Company of those days and a newly incorporated guild, calling themselves the Joiners' Company, which was submitted to the judgment of the Court of Aldermen of the City of London. Curiously enough, the matter in dispute was then—as now—as to what work properly belonged to the carpenter and what to the joiner.

Now, the case for the carpenters was set out in the following terms, curiously worded and quaintly spelt:—

"The originall Charter of the Company of Joyners makes no mention what is their worke or what is not the worke of the carpenters. The statute of Elizabeth makes no mention at all nor speaks a tittle of a joyner, as it doth expressly mention the carpenter, turner, sawyer, and other trades and arts; therefore it is inferred that ye imployement of ye joyner is included in the carpenters' trade and mystery an so hath been promiscuously used and practised by one person. And without question the joyners' trade before incorporation was chiefly to make and sell joyned ware as bedsteads, tables, chaires, stools, &c., and not to doe any other work about the building of houses but what the carpenters employed them in (and this the carpenters did for expedition only), the carpenters themselves generally doing those works they employed the joyners in."

All this took place in 1675, the year of the laying of the first stone of St. Paul's Cathedral, and the joiner, as we
know him to-day, was apparently not yet, and all the best o
tradition passing by—bedsteads, tables, chairs, and stools.
really began to think that I should have to come and tell yo
that joinery proper commenced somewhere about the yea
1700, and that it suffered an existence only during a rathe
dull eighteenth century and a dreadfully dull nineteent
century.

But, after all, is this quite fair to the joiner? For if w
set aside all landmarks and consider the traditions of Eng
lish woodwork and enquire how it was done and by whom
I think we shall in the end find a more extended place i
history for him. Let us shortly examine all woodwor
which (if it were executed to-day) would be the work of th
joiner.

Now we find in the course of history that the crafts o
this country have received two strong artistic impulses, whic
have had very far-reaching effects. The first came fro
France and gave an impetus which resulted in three cen
turies of mediæval craftsmanship, during which th
ecclesiastical type of work was the style, not only of th
church work of the country, but also of the ordinary ever
day work of the period. The second impulse came fro
Italy, and resulted in three centuries of Renaissance craft
manship, during which the fifteenth century revival of le
ters in Italy began to influence this ecclesiastical type o
work in England, and finally displaced it by a style of wo
termed "Renaissance," the character of the work and th
mode of execution differing essentially in the two periods.

### *Mediæval.*

Now, in the mediæval period, the thirteenth, fourteent
and fifteenth centuries, stone was the chief material, a
woodwork follows stonework forms very closely, and, li
stone, it is worked out of the solid.

There is very little woodwork remaining of the earli
part of this period with the exception of roofs, porches, &
which very properly belong exclusively to the carpenter, a
were dealt with by Mr. Banister Fletcher last week.

One of the oldest pieces of joinery in the kingdom is t
Coronation Chair at Westminster Abbey. It belongs to t
great Edwardian period and exhibits the quatrefoil in t
lower part and the trefoil arches in the upper part.

The influence of the stone form is clearly seen by co
paring the chair with the stone screen behind.

The choir stalls and pulpit at Winchester Cathedr
also show the stone influence, for here the panelling behi
the stalls represents a stone-traceried window, while t
canopy above is essentially lithic in character with a slend
central mullion. The same may be said of the open-foil
parapet above: the rich pulpit with canopy on the right
of course, of later date.

The screen to the "Spring pew," at Lavenham Churc
Suffolk, is a delightful example, in which the craftsm
has revelled in producing beautiful form. It is impossi
to imagine anything richer than the tracery of the f
vaulting and pinnacle work of the upper portion.

The ecclesiastical work of this period is very rich in e
borate craftsmanship, and the Bishop's throne and stalls
Exeter are among the most elaborate we possess. Nothi
could well be richer than these foliated arches with ri
cusping, crockets, pinnacles, buttresses, finials.

The pew end from the choir at Beverley Minster is
example of a Perpendicular window reproduced in stone w
transomes, mullions and foliated openings. The carv
angel and poppy are excellent examples of mediæval carvi

The joinery of the period was often enriched with pai
ing, and the screen at Kersey, Suffolk, is a charming
ample. The quatrefoil openings below with engaged shie
and the traceried openings above, with foliated cusping,
Gothic windows in wood, between which the wood mullion
formed as a buttress, the painting taking the place of stai
glass.

Richness of craftsmanship knew no bounds, and
elaborate font cover at All Saints Church, Sudbury, is
Gothic spire of the richest type in miniature translated i
wood. At each stage are pointed tracery windows, buttress
and pinnacles, the whole being crowned by a pointed sp
with carved crockets.

The fifteenth century is, indeed, remarkable for its wea
of woodwork, and the rood-screen at Atherington, in Dev
shire, shows how the traditional design was steadfastly
hered to: each division is an open traceried window, be
which is represented wall panelling and above are porti
of fan vaulting with ribs and panels of wood. The rood-l
over is even richer in treatment on the lines of the lo
portion.

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* A lecture delivered at Carpenters' Hall on February 2 by Sir A. Brumwell Thomas.

### *Early Renaissance.*

We now come to the sixteenth century, which marks the beginning of the Renaissance. Wolsey with his enormous wealth and love of beautiful things is outdone by the king himself, who inherited a vast amount of money accumulated by his parsimonious father, King Henry VII., and has as great a power of spending it as his father of saving it.

Young, handsome, rich—the power of the nobles broken—the power of the king absolute—Henry VIII. vied with young King Francis of France in the patronage of art. Lavish in expenditure, his accounts show the employment of many foreign artists and workmen, with the result that the influence of the revival of classical learning and classical art filtered into the country and this employment of Italian workmen by the king began to influence the ornament, carving, &c., of the work of the period.

In the screen of King's College, Cambridge, which is accounted the finest example of woodwork in England, there are distinct traces of this Italian influence, and it is quite clear from the detail that it must have been executed by foreign workmen, as the English workmen, at this time, could not have acquired the necessary skill.

As later on you will come to see the German influence, I want you to notice the purity of the detail, the proportion of the pilasters, the delicacy of the moulding and the distribution of the ornament in this example of the Italian influence, and in considering how mature and finished this work is, you must take into consideration that the revival in Italy began 100 years earlier than in England. The other side of the screen shows the stalls with their slender baluster shafts. It is not known who is the designer, but the date is fixed by the initials of Henry and Anne Boleyn, joined in a true lover's knot in the coved roof of one of the stalls.

This brings us on to the age of Elizabeth which was one of great national prosperity. The people had grown in riches, much of it derived from the suppressed monasteries; the population had increased from four to five millions, and was nearly equal to London of to-day.

The country was at peace, and every peaceful art prospered. By this time the Italians had left the country, probably owing to Henry's quarrels with Rome, and a new influence had begun through the coming of German workmen, who brought with them the Low Country interpretation of the Renaissance. Religious persecution no doubt brought them here, and they settled in great numbers.

Freedom from strife brought desire for domestic comfort, impossible while security from assault was the first consideration for house building, and an amiable contest began as to who should build the largest house, the longest gallery, noblest fireplace and the most beautiful staircase.

Audley End in Essex is one of the finest examples of an Elizabethan hall. The house formerly possessed a gallery 226 feet long, which was taken down at the beginning of the eighteenth century, but it still remains a fine and stately mansion. The caryatides at the doorway in the screen are typical of the German influence. The carved mantlepiece is, in the usual manner, decorated with an architectural order, and the coat of arms bulks large in the design. The flat roof divided into panels by wood beams with plaster filling marks the change from the mediæval open roofs dealt with in the carpentry lecture last week.

The hall screen is one of the features of the period, and that at Chastleton House, Oxford, has the two doorways in similar position to those of the mediæval period. The Ionic order beside the doors and the obelisk and open fret crowning the entablature are indicative of the period, which is also shown in the charming little clock case between the doors.

The Universities of Oxford and Cambridge still possess a number of fine screens of this period, and that at Jesus College is one of the best known. Here also the doorways are placed between the columned order, and the entablature is very richly carved. The treatment of the small panel in the wall space between the doors marks a step in the progress of panelling, and shows how the adoption of the "true mitre" in the place of the "mason's mitre" lent itself to the fanciful forms in panelling peculiar to Jacobean joinery and urniture.

The dissolution of the monasteries and the distribution of their treasure put an end to church building, but existing hurches were lavishly decorated with examples of the work f this period. Croscombe Church, Somerset, has a delightul screen with columns and entablature and fretted cresting nd bold Royal arms. The pulpit at the left is a most charming specimen of restraint in design with quite a sumptuous sounding board over, also with fret cresting.

An interesting feature belonging to the time is the internal porch, such as that at Broughton, in Oxfordshire. It is designed to give access from one room to another without entering the intermediate room. This is a well-known example. It has the Doric order and enriched entablature, the owner's arms in a circle and carved pinnacles on either side. There are a number of these in different parts of the country, and the one at the Red Lodge, Bristol, has the Ionic order beside the door and caryatid figures in the frieze.

The dining-room door at Levens Hall, in Westmoreland, is a very rich example, with lozenge-shaped panels within the square panels. On either side are caryatid figures on high pedestals, and the doorhead has the owner's coat of arms with supporters.

The bay window at Little Moreton Hall, in Cheshire, shows how traditional design still lingered. Here in a county remote from the influence of the Renaissance, we still find the mediæval wood mullion in the window, the walls panelled in a simple manner, the ceiling joists showing the true construction.

The fireplace at Blickling Hall, in Norfolk, is characteristic of the sumptuous taste of the time. The open dog grate is flanked with coupled baluster columns, and the overmantle is supported by the typical rounded cornice, and shows again the caryatides and the family arms.

In the development of house-planning, the hall, which originally served as general dining-room, underwent considerable change. When the long gallery came into vogue the principal apartments were transferred to the first floor, and their stateliness needed more sumptuous approach than the mediæval stone stair, and the broad, easy wood staircase became one of the features of the hall. That at Castle Ashby, Northamptonshire, shows how the craftsman lavished all his skill in the carved entablature and fretted panel. The newels in this instance are carried up as ornamental columns to support the landing over and the vine weaved round the columns is very charming.

There are innumerable examples of these staircases in various parts of the country, but I will show you one more only. The staircase at Hatfield, in Herts, the home of the Cecil family, is one of the best known and one of the best executed we have. The newels are carved with strap ornament and terminate with carved figures, and the balustrade is an arcade of small columns and arches. The gates seen here are supposed to have been to prevent the dogs wandering up to the State apartments upstairs. The fretted carving on the soffit of the stairs is very interesting.

This is a very picturesque period in English craftsmanship, but these staircases, lavishly overladen with a riot of carving and moulding, cannot be accounted of greatest artistic value. Invention is at its lowest; in fact, the resources of the master carpenter, so far as design was concerned, had almost come to an end, and as you have seen, he was relying upon repetition of elaborate pattern-book detail to gain effect.

In the early period—the mediæval period—the tradition had grown up by degrees. The English craftsman was sure of himself, sure of his craft. But this was gone. The old tradition was almost lost, and the full understanding of the Palladianism which was coming was beyond the powers of the craftsman designer. It was in the air, but its full comprehension necessitated a scholarship quite outside the powers of one who in all probability could hardly write. The consequence was, that in the latter half of the century the designer was beginning to detach himself from the craftsman. The end of it saw the beginning of a new order, when the responsibility for design, as apart from execution, was transferred from the craftsman to the designer to be known hereafter as the architect, and at the moment England produced a genius of the highest order, and, as Walpole said, England had at last produced one great artist, Inigo Jones.

Not a great deal is known of the first thirty years of his life, except that he travelled and studied in Italy, and thoroughly absorbed the spirit of Palladian design. The double-cube room in Wilton House, which he rebuilt for the Earl of Pembroke, is probably the most beautiful room in the country, and the banquet hall is unquestionably the finest State room.

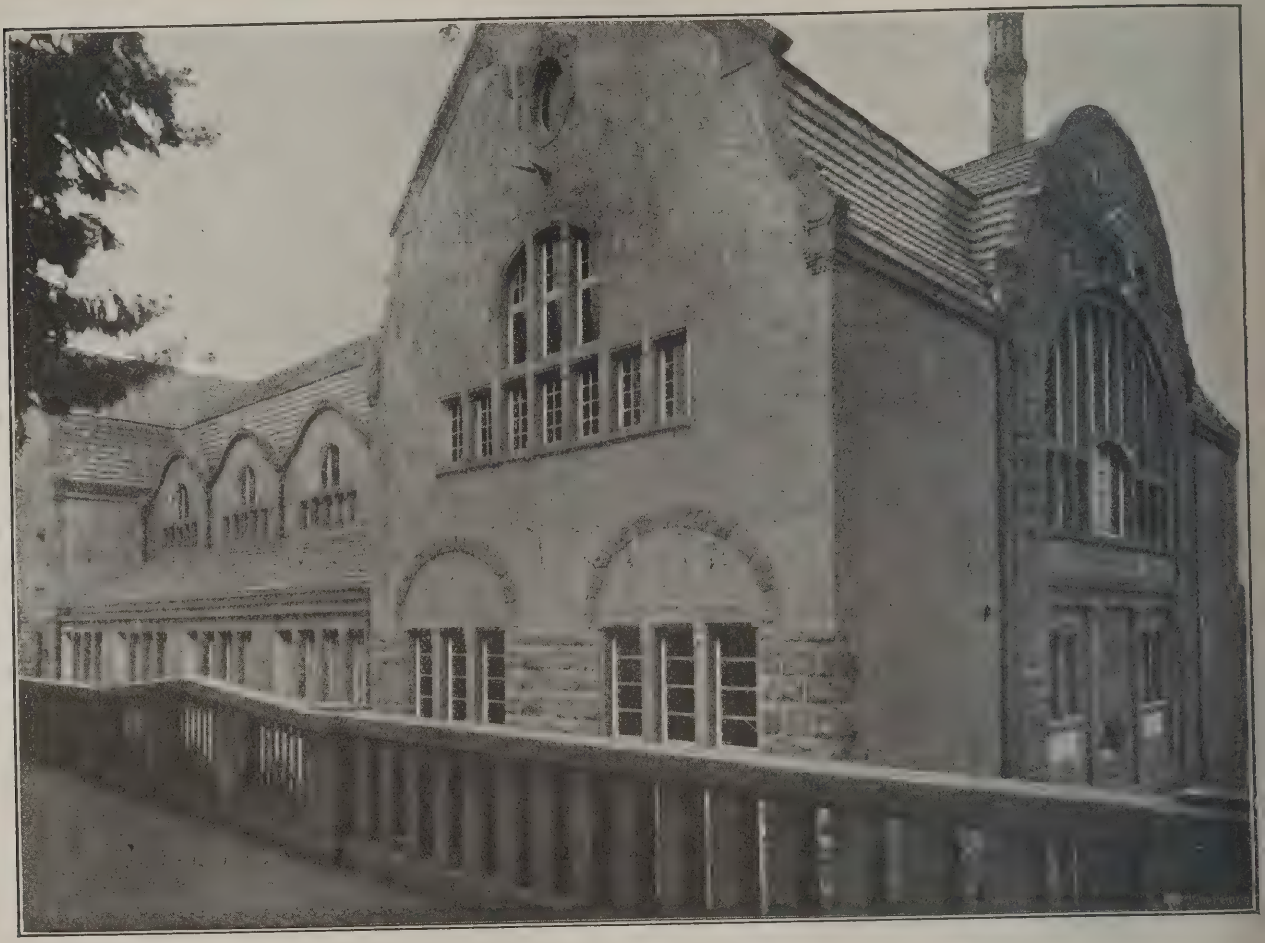
The fireplace in the double-cube room is quite magnificent, and you see at once the purity and dignity of his work.

Ashburnham House, a little house in Dean's Yard, is a delightful example of planning and delicacy of detail. The staircase is quite a masterpiece; in fact, the whole interior is most carefully arranged and designed, and the doorway off the first-floor landing shows great care and refinement.

There is also a screen at Kirby Hall, which is probably

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Der Profanbau.*

MUNICIPAL BATHS AT ISERLOHN.—Herr Stadtbaurat Falkenroth, Architect.

the work of Inigo Jones, and shows the same calm sureness and restraint of his work as Wilton. I wish I could show you more of his work, but I am afraid I should be straying outside my subject.

Inigo Jones's great successor was a man full of scholarship and accomplishment. Sir Christopher Wren, although to begin with was almost an amateur, when the time came it was a case of the hour and the man.

The Fire of London was Wren's great opportunity. The City was a "ruinous heap." The largest and most magnificent cathedral in England, ninety-three parish churches, the Guildhall, Royal Exchange, and fifty City companies' halls, besides 13,000 houses, all swept away.

The organ case of St. Paul's Cathedral is, as you will see, a most beautiful piece of design, and will stand as a monument to the skill of the craftsmen who fashioned it. It is most exquisitely carved, and the big masses impart to the whole a fine sense of grandeur rarely obtained. The caryatides and the central scroll pediment supporting the Royal arms are carved out of solid material and not "built up," as is usual in masses of their size and projection. It will not be apparent to you in this view, but as evidence of the sound construction and the mature state of the wood used it may be observed that scarcely a crack or an opened joint is to be found in the whole case.

Here you have the choir stalls showing the panelling behind with its rich cornice and gallery front. Again, you will notice the great projection of the carving, and it is well to remember that for forty years before this time little heavy construction and no such masses were obtained for carving. In looking at these views one must not, in admiring the carved work, overlook the beauty of the joinery, which is the foundation of the whole conception. The Bishop's throne, which you see at the farther end of the picture, with its enriched pediment and canopy with pierced scrolls and cherub heads, forms a most beautiful termination to the screen.

Leaving the wonderful display of rich carved work shown on these two views, we see the back of the choir stalls, or ambulatory, with Corinthian columns, fluted shafts, a
rich capitals, forming a screen between the stone colum
which support the domed ceiling above.

Before leaving St. Paul's, I wish to show you the beau
ful screen to the north-west chapel.

The pulpit and sounding board of St. Stephen's, W
brook, is amongst the best work of the period, both in desi
and construction. The view shows the pulpit having
panelled sides, the panel and other mouldings being rich
treated. The whole is supported on a square pillar with c
and base. The lines of the cornice of the sounding board
curved and give interest, and impart an appearance of lig
ness to the structure. Carving is freely introduced, and
cherubs, &c., are well placed.

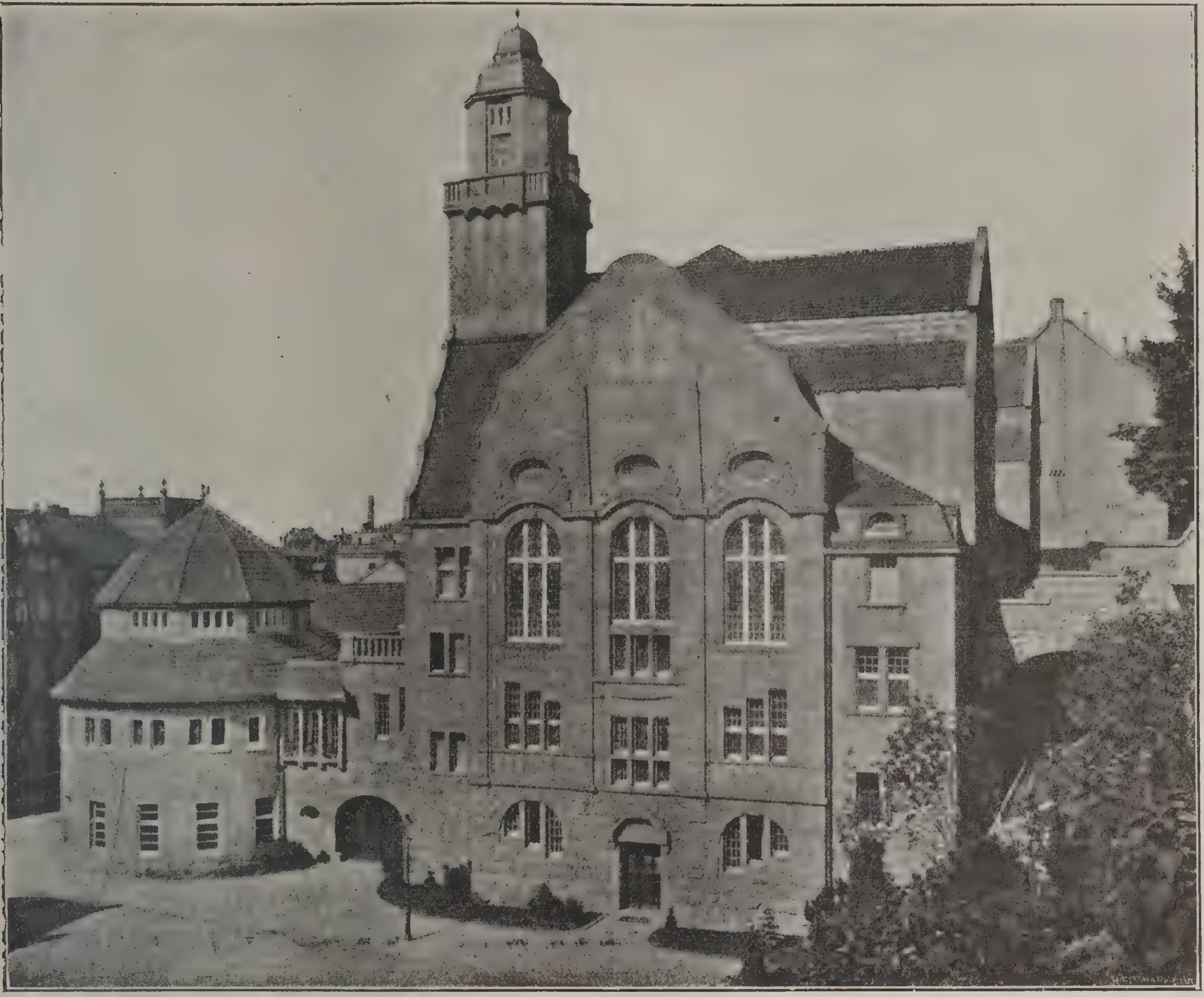
The east view of the chapel at Trinity College, Oxfo
shows the reredos with slender Corinthian columns, wh
support an entablature and curved pediment, breaking b
and continuing on face of tympanum. The cornice is trea
in an original manner, the whole of the lower part be
occupied by a highly enriched leaf moulding. The la
centre panel between the columns has a fine treatment
carving surrounding it, and in the centre is massed up ab
the architrave of the main entablature.

The treatment of the screen here is similar to the east
end of the chapel, the centre being occupied by the doorw
It will be noticed that the surface of the two side panel
richly carved and drapery is introduced at the top in p
of the fruit, &c., on the panel at the east end. The v
shows the wall panelling, the capping of which ramps u
the entablature of the screen.

In the Orangery at Kensington we find restfulness
impressiveness. The treatment is simple and broad. T
is no carving adorning the general surface upon the niche
doors. The columns are Corinthian, carved, and severa
the members of the entablature are enriched.

There are two very charming doorways in Laur
Pountney Lane, beautifully enriched with carving
canopies.

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Der Profanbau.*

MUNICIPAL BATHS AT ISERLOHN.—Herr Stadtbaurat Falkenroth, Architect.

Clifford's Inn is a fine example of wall panelling, treated on broad lines. The panels are large, and, except over himney-piece and door, are not enriched. The mounting of he oak is shown quite clearly, and is very effective. The doorway on left is finely carved, and is surmounted by a arved and curved pediment.

The walls of the chapel at Farnham Castle are panelled, nd the spaces between enriched with beautifully carved herubs' heads and drops. Above the panels are placed carved heaves, and at the base charming scrolls are introduced. The pulpit is cleverly arranged in the thickness of the wall, nd is reached through a secret door in the panelling.

In the Court Room of the Brewers' Company, in London, s a fine example of bolection moulded panelling. The doorway and chimney-piece are good, but the carving over the himney-piece cannot be considered satisfactory.

This view shows the screen with column and pediment orming the doorway through the screen. The cartouche over ediment and the figures at side should be noticed.

With all this tradition before you it may interest you to ee how the progress of the past influences modern work, and will now show you some of the joinery of public buildings nd private houses that belong to the twentieth century.

Town house interiors, Mr. John Belcher, R.A.

Town House interiors, Mr. Reginald Blomfield, A.R.A.

Country house interiors, Mr. Voysey.

Country house interiors, Mr. Guy Dawber.

Council Chamber, Cardiff Town Hall, Messrs. Lanchester & Rickards.

Council Chamber, Woolwich, Sir Brumwell Thomas.

Council Chamber, Stockport, Sir Brumwell Thomas.

Furniture, Belfast, Stockport, and Woolwich, Sir Brumwell Thomas.

This brings to an end the traditional forms, and now let us gather up a few of the practical indications of the progress of the craft.

First of all there is the essential difference between Mediæval and Renaissance craftsmanship, that the earlier forms were worked out of the solid wood in the same manner as stonework.

From the sixteenth century onward, in place of the heavy axed, or hewn, oak, the principal characteristic of the construction of the joinery of the period is that of "building up." In the fifteenth century the work was cut out of the solid plank; in the sixteenth the required projection was obtained by placing one piece of wood on another.

In the earlier period the panel moulds were worked on the solid styles and rails, and met at the angles in a mason's joint. Later on they met in a true mitre, but the moulding was still worked on the solid. Later still we have the mitred moulding planted on, and latest of all the bolection moulding.

One of the greatest changes, however, was the invention of sash windows early in the seventeenth century; the introduction of ground and rebated jambs to doors, and, above all, the geometrical staircase, the continuous handrail requiring considerable skill in geometry to find the lines by which it was set out.

And now, in conclusion, what of our original inquiry, Where does the work of the carpenter end and that of the joiner begin? and I think you have already found the answer. In the early days we find simple conditions in which are concentrated in one man—the master craftsman—all the qualities that to-day are distributed over a number of trades and professions. We all claim our share. The modern architect, builder, carpenter, and joiner are the successors of the mediæval master-craftsman, each claiming a share in the rich tradition of woodwork that we have—all too cursorily—examined in the short space of an hour this evening.

## ANCIENT LIGHT CASE.

THE action by Mr. Alexander Murray Smith against the Anglo-American Oil Company, Ltd., to restrain an alleged obstruction of ancient lights from a building now being erected by the defendants on the site of 36 and 38 Queen Anne's Gate, was further mentioned to Mr. Justice Joyce in the Chancery Division on February 4.

Upon the suggestion of his Lordship, when the matter was under consideration on February 1, counsel agreed that it should be referred to Mr. John Slater, B.A., F.R.I.B.A., for report, and the question now raised related to the terms of reference.

Mr. Younger, K.C. (for the defendants), suggested, in the first place, that the respective models prepared by each party should be submitted to Mr. Slater.

Mr. Hughes, K.C., on behalf of the plaintiff, raised no objection to this. Proceeding, he urged the desirability of one gentleman attending before Mr. Slater in representation of each party. The defendants had suggested that two should attend.

Mr. Younger said the reason was this: there were two ways in which the case might be met, viz. from the point of view of the ordinary practical man—that the interference alleged was of no practical importance—and that it was merely a technical interference, if any.

His Lordship: I am not going to make it a "hearing" before Mr. Slater.

Mr. Hughes: There is a provision that he can have what assistance he likes. I would suggest that one from either side should attend him on one occasion and on such other occasions, if any, as he may desire.

Mr. Younger: But these orders are made with a view of getting the best possible report.

His Lordship: They should not attend whenever they please.

Mr. Younger: My friend wishes to tie me down to one occasion.

Mr. Hughes said this was not quite so, as Mr. Slater could invite them to attend on other occasions if he wished. He thought it fair that they should have the right to attend on one occasion and put their views before Mr. Slater.

Eventually the form agreed upon in this connection was similar to that adopted in the Westminster Hospital case, viz. that the representatives of either side should attend "if and when desired." It was also agreed that, apart from the steel construction, the work should not be proceeded with above the cornice on the western boundary of the house formerly known as 38 Queen Anne's Gate, and that the completion of the trial should be expedited as much as possible.

His Lordship then made an order of reference upon the terms discussed and agreed to.

## GUILD OF ARCHITECTS' ASSISTANTS.

THE first annual meeting of the South Wales branch of the above Guild was held in Cardiff on Thursday, January 27. In the unavoidable absence of the hon. secretary, Mr. Harris gave a short résumé of the progress which had been made since the formation of the Guild. He said a lot of uphill work had had to be accomplished, for as always happened in forming new organisations there was a tremendous lot of labour involved in overcoming the lack of enthusiasm which existed amongst those whom the Guild was formed to benefit. Everyone recognised the need of such an organisation among architects' assistants, and yet few seemed willing to put their shoulders to the wheel and help on the work. There was a lot of preliminary, and it might seem to some, thankless labour, before any great measure of success could be attained; and yet he was certain they had every reason to be pleased with their progress. In time he felt sure the Guild would be a real live force in the profession and of inestimable value to the younger generation of architects.

The "constitution" of the Guild was then fully discussed, and the proposed laws and regulations were in general approved. The relation of the local branches to the central body came in for detailed criticism, but it was generally conceded that the proposals submitted to the members (published in the papers the preceding week) were for the most part quite satisfactory, and the hon. secretary was instructed to report to this effect to headquarters.

There is therefore every expectation that if the other branches adopt the proposed "constitution" the Guild will soon be recognised as a firmly organised national body.

## TOWN PLANNING CONFERENCE.

IN view of the recent passing into law of the Housing and Town Planning Act, 1909, it is of the utmost importance that the architectural development of towns should receive the most careful consideration. The Royal Institute of British Architects has therefore decided to organise a Conference to study the architectural problems involved in the improvement and extension of our cities. The co-operation of all our readers is invited in this Conference, which will be held in London from July 11 to 16, at the Royal Institute, 9 Conduit Street, Regent Street, London, W.

His Majesty the King has graciously extended his patronage to the Conference.

The programme of the Conference will include an exhibition of drawings, plans, models, and literature bearing upon the subject, and a large number of town plans and views will be displayed by means of lantern slides.

It is expected that papers will be contributed by leading authorities on the various aspects of town planning, and that there will be a large number of visitors from the Continent and America in addition to those interested in the subject in this country.

Membership of the Conference will be open to architects and all others, including ladies, interested in town planning. Members will be privileged to attend the inaugural meeting and the receptions that will be arranged all the meetings of the Conference; the visits and the banquet (on payment of the necessary charges); and they will receive all the literature issued in connection with the Conference, including a copy of the illustrated volume o transactions to be published subsequently.

The membership fee will be one guinea. If those interested in the Conference will apply to the Secretary the Royal Institute of British Architects, 9 Conduit Street Regent Street, London, W., they will receive furthe particulars of the programme of the Conference, with form of application for membership.

As the number attending the Conference is necessaril limited, an early reply is desirable.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* devotes its illustrations to th work of Messrs. Clinton & Russell, the buildings b whom that are included being the Apthorp Apartments, huge block of flats on an island site bounded by Broadway West End Avenue, 78th and 79th Streets, New York Whitney Central National Bank Building, a sky-scraper i New Orleans; the Mutual Assurance Society Building another tall erection in Richmond, Virginia; the Hudso Terminal Buildings, New York, also a sky-scraper; and tw sumptuous new ball rooms added to the Hotel Astor, Ne York.

*La Construction Moderne* illustrates a château at Neu kirchen, in Lorraine, of which MM. Berninger & Krafft a the architects, and in its series of articles on Old Paris no deals with the Quartier Saint-Benoit.

*Der Architekt* contains a "new art" design for a pictu gallery at Reichenberg, by H. Ried; a simple and successf town house at Brünn, by Professor Maxim Monter, and tw charming examples of old courtyards with fountains.

*Engineering Record* has an interesting article on the com parative cost of plain and reinforced concrete columns, b Mr. Charles W. Hall, showing under what conditions the o is more economical than the other.

## COMPETITIONS.

Herne Bay.—Messrs. Percy J. Waldram and F. C. Mo crop Young have been awarded the first premium twenty-five guineas in the competition for a pavilion to erected on the proposed pier extension at Herne Bay at cost of 4,000*l*. Mr. Edwin T. Hall, F.R.I.B.A., acted assessor for the urban district council.

Peterborough.—The R.I.B.A. competitions committ are in communication with the promoters of the competiti for secondary school at Peterborough with a view to t amendment of the conditions.

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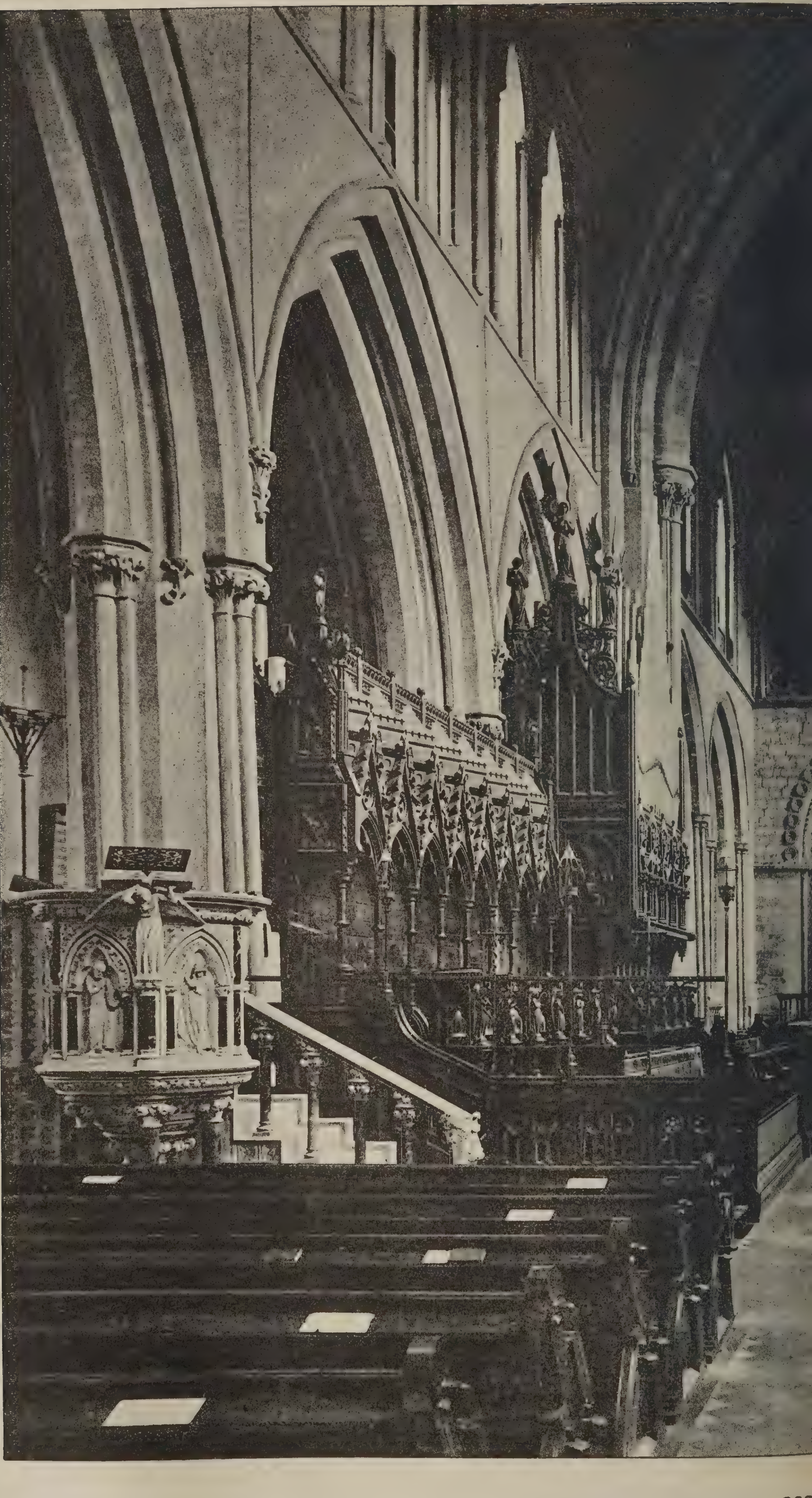
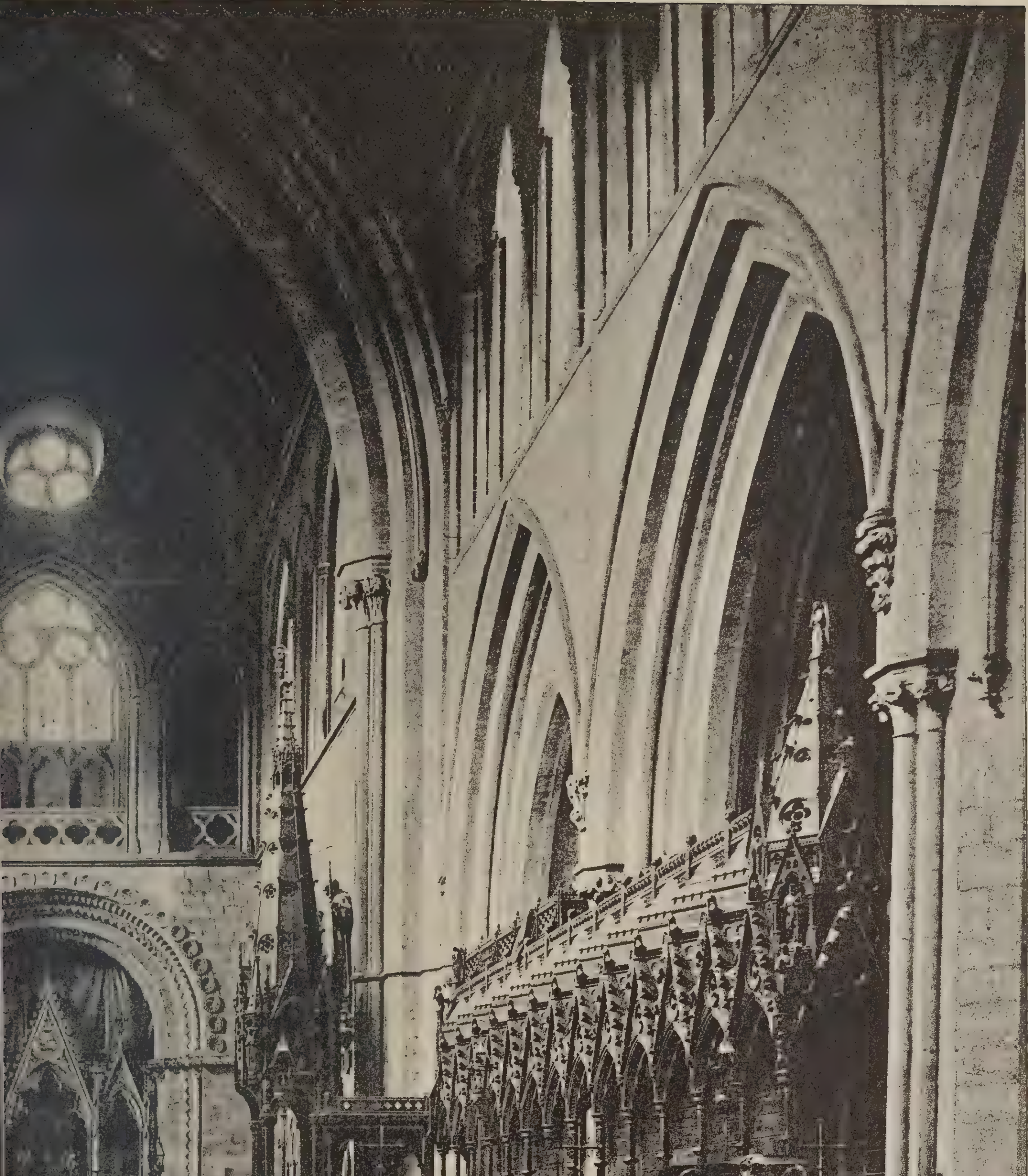


CATHEDRAL SERIES, NO. 660



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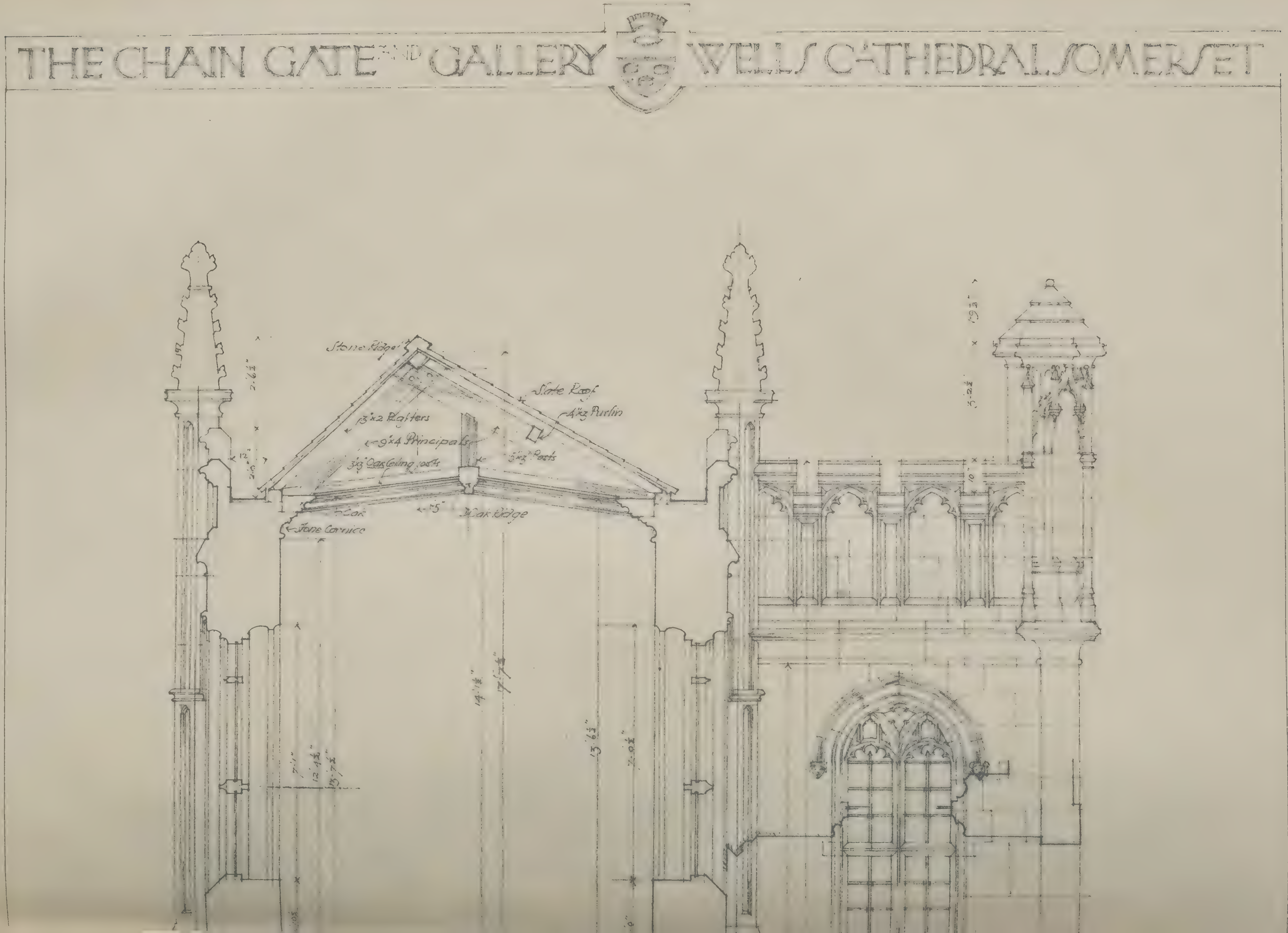
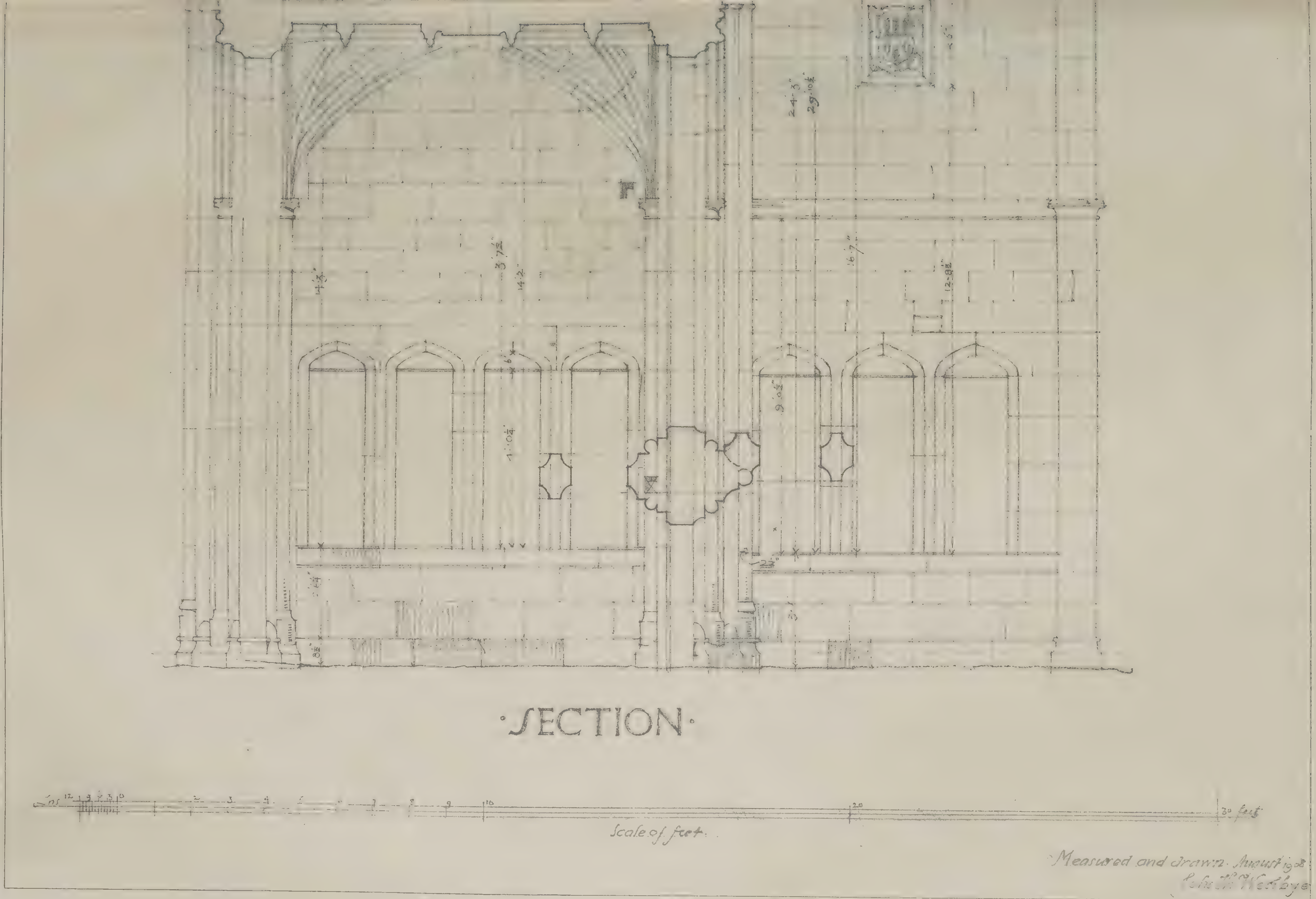
# THE CHAIN GATE AND GALLERY WELLS CATHEDRAL SOMERSET





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THE CHAIN GATEWAY, WELLS CATHEDRAL.

Measured and Drawn by JOHN TH. WESTBYE, Architect.

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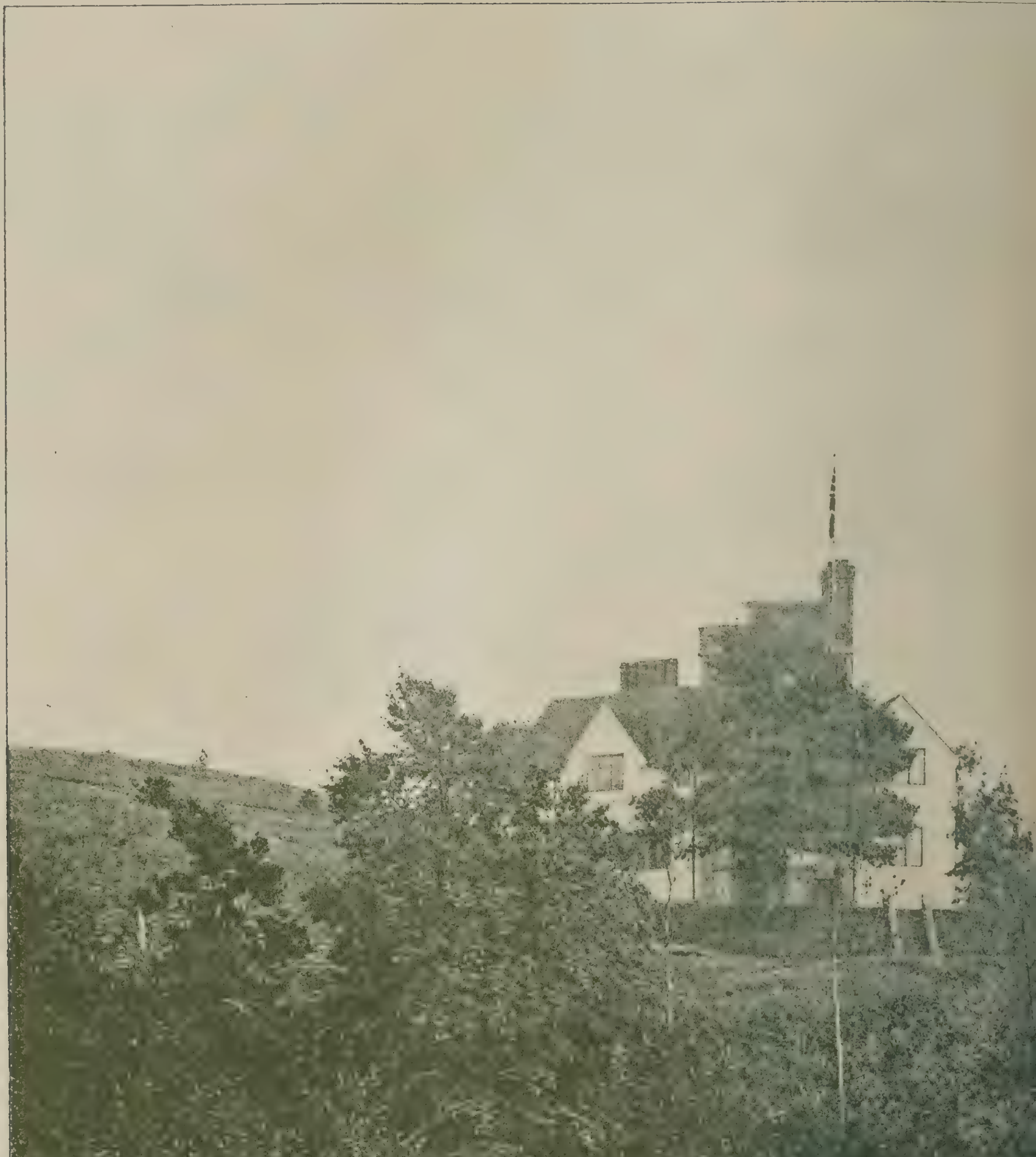

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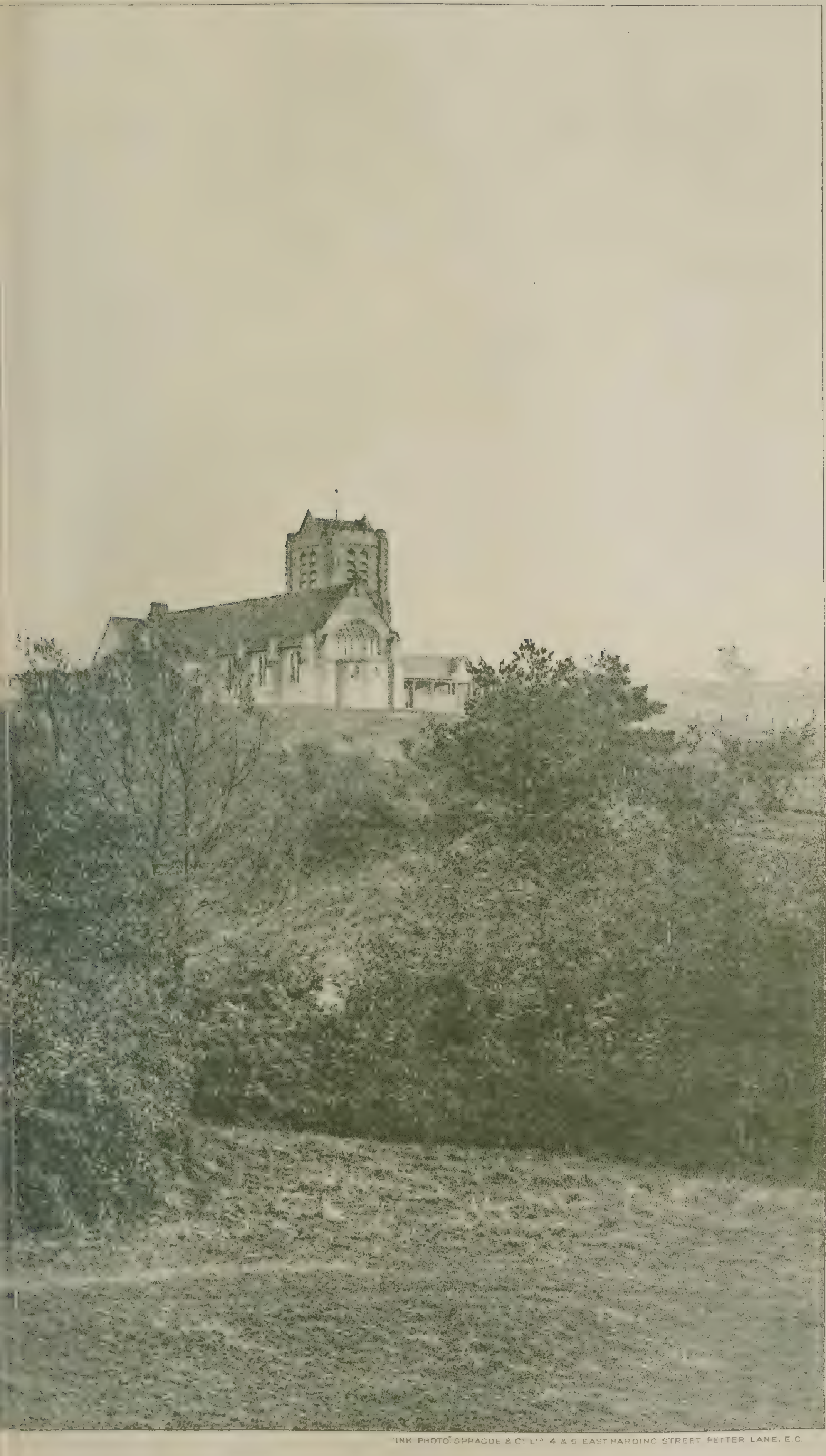
DODFORD CHURCH, AND "TH

Mr. ARTHUR BART



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OVER," FROM THE NORTH-WEST.

F.I.B.A., Architect.

UNIVERSITY OF ILLINOIS

# The Architect.

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## FORTHCOMING EVENTS.

*Friday, February* 18.

Architectural Association : Paper on "The Life and Work of William Butterfield," by Mr. E. Swinfen Harris, F.R.I.B.A.

Leicester and Leicestershire Society of Architects: Paper on "Drainage and Sanitary Fittings," by Mr. S. P. Pick, F.R.I.B.A.

*Monday, February* 21.

Royal Academy : Course of Four Lectures on Architecture, by Professor R. T. Blomfield, A.R.A. ; (3) "Pierre Lescot and Jean Goujon."

Bristol Society of Architects : Paper on "The Architectural Treatment of Reinforced Concrete," by Mr. J. H. Markham, A.R.I.B.A.

*Wednesday, February* 23.

Manchester Society of Architects : Paper on "Draughtsmanship, by Mr. Paul Waterhouse, M.A., F.R.I.B.A.

*Thursday, February* 24.

Royal Academy : Course of Four Lectures on Architecture, by Professor R. T. Blomfield, A.R.A. ; (4) "French Sculpture in the 16th Century."

Leeds and Yorkshire Architectural Society : Paper on "The Church of Santa Sophia," by Mr. J. B. Fulton, A.R.I.B.A.

## BOILERS AND THEIR FUEL.

IN the valuable series of experiments that the Engineering Experiment Station of the University of Illinois has been carrying out, for the benefit of the United States in particular and the whole constructive world in general, there have been included some fuel tests with house-heating boilers, recently published in the usual bulletin form adopted by the University, which, although they deal principally with fuel in use in Illinois and other parts of the United States nevertheless contain lessons that we think may be useful to ourselves.

The fuels with which the tests were made were anthracite, Pocahontas coal, which corresponds fairly closely to our steam coal from Barnsley, coke and Illinois coal, which seems to resemble the soft coal in general use in English houses.

The purpose of the tests was twofold. First, to obtain the information usually obtained from boiler trials when operating upon house-heating boilers with various types of fuel commonly used for domestic purposes, in order that comparison might readily be made; second, to obtain information that might assist in developing satisfactory methods for conducting house-heating boiler trials, whether the object of the test be to test the fuel, the equipment, or the two combined.

With regard to efficiency and fuel cost the conclusions arrived at were:—The evaporative efficiencies of house-heating boilers vary greatly with changes in other conditions, and extreme care should be used in making comparisons; the efficiencies for the tests under consideration varied from 44 per cent. to 66 per cent., but a still wider range of efficiencies will exist under the variable capacity conditions common to average residence heating work; the range in efficiencies found was due principally to the kinds of fuel tested; fuels high in fixed carbon content, such as anthracite and coke, give relatively high efficiencies as compared with fuels low in fixed carbon content, such as our English domestic coal; present methods of burning and present types of boilers in the United States are particularly well adapted to burning anthracite and other coals high in carbon content—this also applies to the usual methods and types employed in Great Britain. A high fixed carbon content as opposed to a high volatile content is desirable in a fuel for domestic purposes; the low efficiencies with fuel of high volatile content, such as the Illinois coal, indicate the necessity of improvement as to equipment and methods of burning in order that this fuel may be placed more nearly on an equal footing with other fuels in this respect when employed for house-heating purposes; variations in efficiencies, apparently due to slight changes in fire and other conditions indicate the possibility of obtaining higher efficiencies in many cases by careful attention to details relating to fuel, operation and equipment.

Illinois coal may be obtained at from quarter to half of the cost per ton of anthracite, but the cost per British thermal unit will be relatively slightly higher for Illinois coal than when expressed as cost per ton. The cost per ton of 2,000 lb. of the fuels with which the tests were made was for anthracite 8.25 dollars, Pocahontas coal 5.50 dollars, gas-house coke 5 dollars, Solvay coke 6 dollars, Illinois coal from 3.75 dollars to 2.85 dollars. The cost relative to efficiency is shown by the tests to be considerably lower for Illinois coal per British thermal unit, as well as per ton, whether compared with anthracite, Pocahontas coal or coke, for with Illinois coal as fuel water can be evaporated in house-heating boilers at about 50 per cent. of the fuel cost of anthracite and about 75 per cent. of the fuel cost of Pocahontas coal or coke.

The relatively low cost of Illinois or soft coal is considered to ensure its continued use for domestic purposes, and whilst improvements in methods of burning and equipment are needed, these improvements, tending towards a reduction of smoke, dirt, or other disadvantages connected with the burning of the cheaper coal, will doubtless also increase the efficiency with which that fuel may be used, and make the fuel cost differences still more favourable to the cheaper fuel.

In regard of cleanliness, control and attendance, anthracite and Pocahontas coal are particularly well adapted to maintaining uniform pressure and fire conditions over a long period of time with little attention. The quick-burning Illinois coals are much less reliable in this respect.

Satisfactory regulation is more readily accomplished with the Eastern fuels and with coke than with the Illinois coal, whilst the total attendance required may be considerably less when burning anthracite than the other fuels. The same may be said in general as between coke and Pocahontas as compared with the Illinois coal. This condition would be especially noticeable in connection with heating apparatus used in residence work.

Anthracite and coke possess marked advantages over the other fuels, especially over the Illinois or soft coal, with respect to cleanliness. They are in general cleaner in and about the boiler room and do not smoke either from the chimney or in the boiler room. Little trouble is experienced with soot or ash in the flues, and with reasonable care noxious gases should not be given off in the furnace room; also, the ash is small in amount and easily handled.

In considering house-heating boiler tests, a number of important considerations, such as efficiency, fuel cost, attendance, control, cleanliness and equipment must be taken into account. The relative importance of such factors cannot be stated definitely and varies greatly with the nature of the service required of any given installation.

Efficiency and fuel cost may become the items of greatest importance when heating work is upon a comparatively large scale approaching boiler conditions.

Simplicity and the ease with which the heating apparatus can be cared for may be of greater importance than high evaporative efficiency.

The condition which requires the minimum amount of attendance may in other instances be the most satisfactory and economical, and more than compensate for the consumption of some extra fuel.

The ability to get up steam quickly and to maintain uniform pressure and fire conditions over comparatively long periods of time may be of paramount importance rather than questions relating to either fuel or equipment.

Yet again, the desire or necessity for cleanliness with respect to smoke, soot, ash, and dust or dirt in the boiler room, may warrant the use of high-priced fuel.

In the tests that were made some special points ought to be noticed. It was considered that in connection with house-heating boiler work, in order that information relative to capacity might have the greatest usefulness, it should be based upon the evaporation which could be obtained during a period of from six to eight hours without attention, rather than upon the evaporation obtained in one hour with whatever attendance might be required. Hence the conditions of the tests were rather in favour of those fuels that required little attendance.

For all tests a load equivalent to about 65 per cent. of the boiler rating was maintained by means of a suitable sized orifice in the outlet. The evaporation of 0.3 lb. of water from and at 212° F. was assumed as equivalent to serving one square foot of radiation for one hour. A pressure of 5 lb. controlled by the automatic regulators which are a part of the boilers was maintained at the boiler.

The amount of fuel as fired per square foot of grate surface per hour varied somewhat with the boilers used and the fuel consumed, being in one case 5.6 lb. for anthracite, 5.2 lb. for hard coal (Pocahontas), 5.3 lb. for gas coke, and 6.0 lb., 7.1 lb., and 6.2 lb. for three varieties of Illinois or soft coal, and in the other case 4.4 lb. for anthracite, 4.1 lb. for Pocahontas, 4.2 lb. for gas coke, and 5.3 lb., 6.2 lb., and 5.8 lb. for the Illinois coals.

The cost with both boilers per 14,600 British thermal units was with anthracite .47 cents., with Pocahontas coal .27 cents., with gas coke .30 cents, and with Illinois coals .22, .23, and .18 cents, the lowest cost per 14,600 British thermal units being obtained from the cheapest coal, that at 2.85 dollars per ton of 2,000 lb.

These results are thus of considerable interest, but in consideration of them for our own edification the relative prices of anthracite, coke, hard or steam coal, and soft or house coal must be borne in mind. It is not often, for example, that a British heating apparatus can be fired with coal at 2.85 dollars per ton of 2,000 lbs.

## NOTES AND COMMENTS.

It is amusing to hear from the Rev. J. B. Lock, in the paper he read at the Royal Sanitary Institute on the "Ventilation of the Large Examination Hall at Cambridge," an abstract of which we give elsewhere, that Dr. Shaw was the first to point out the advantages of what Mr. Lock calls the two-fan system of ventilation, but which Dr. Shaw in his lectures a few years ago styled the system of "Zero-potential."

This system was introduced by Professor Dr. C. Bohm in the Opera House at Vienna, which was built between the years 1861 and 1868, and has been adopted in many of the great public buildings erected around the Ring as well as in Germany, Italy and France. A description of the manner in which the system has been applied in the public buildings of Vienna was given by Mr. F. R. Farrow in his report to the Royal Institute of British Architects on his tour as holder of the Godwin Bursary in the year 1884.

The "two-fan" or "zero-potential" system is undoubtedly an excellent one, as both inlets and outlets being under complete control it is possible to arrange the course of the air currents in any desired direction. It is only necessary to avoid the causation of local draughts and to provide for an evenly distributed flow of the air currents to ensure a satisfactory result superior to that of the plenum system, and still more of the vacuum system. As regards cost the zero-potential system will usually be somewhat more expensive in its first installation, but little if at all more in working. The exact result in the matter of cost will, however, depend on the precise circumstances of each particular case.

Those of our readers who appreciate the series of articles now appearing in our columns on "Modern Cold Storage and Refrigeration" will be interested to know that an International Congress of Refrigeration will be held at Vienna, from October 6 to 12 next. Receptions will be given by the cities of Vienna and Budapest to the delegates as well as by the Imperial Court, and various subjects relating to cold storage and transport will be discussed. Mr. R. M. Leonard, of 3 Oxford Court, Cannon Street, London, is the Hon. Secretary of the British Committe arranging the representation of the United Kingdom at th Congress.

Mr. H. B. Woodward's little book on "Th Geology of the London District" should be interesting t architects practising in the Metropolis, as affording an in dication of the probable location of the undergroun streams that so often provide unpleasant surprises. Th area now covered with buildings and streets was in day gone by intersected by numerous brooks and streams, th names of some of which, as the Fleet, the Holborn, West bourne, Tyburn, are still preserved in our local nomencla ture. Now it is a mistake to suppose that all of these hav been absorbed by the modern system of sewers, or hav become extinct, although they may have vanished from th surface topography of London. Under St. Paul's Cathe dral, crossing Piccadilly, Burlington Street, Knightsbridg and in many other parts of London at a considerable dis tance from the present channel of the Thames, there a to-day flowing streams which often cause trouble in buil ing, particularly when deep basements and sub-basemen or tube railways are being constructed, and a knowledge the ancient hydrography of the Thames basin would ofte prove useful in assisting an intelligent anticipation of po sible difficulties.

We are pleased to note that in the International Exhib tion of Railways and Land Transport to be held at Buen Aires from May to December of this year, Great Britain h applied for space of 20,000 square mètres, Germany 6,00 Austria 5,000, Belgium 4,000, Italy 5,000, the Unit States of North America 5,000, whilst France will occu about 5,000 square mètres. As the total of imports a exports between the United Kingdom and the Argentine more than double that of any other country it is only fitti that we should be well represented in the Internation Exhibition.

The case of Gibb *v.* Schintz is illustrative of t present severe view that the law takes of an architect w lets a builder get the best of him. Shortly the prese legal position of architect and client is that if the contr is not carried out strictly, the architect is liable for a damage the client may thereby sustain. The cases th come before the Courts and are reported are but a few those that are continually occurring, and we know several instances in which architects have paid up rat than face the practical certainty of an adverse judgme after trial. It is manifestly impossible for an architect completely supervise everything that is done in a buildi unless he acts as his own clerk of works and stays on job the whole time that workmen are there. Therefore is imperatively necessary that in every case an architect should insist on the employment of a qualified clerk of works, and should in writing protect himself against any dereliction of duty by the clerk of works. It is no use trying to be kind to the client because the job is a small one. It is just in the small job, carried out without a clerk of works, that the architect is most likely to be called upon to make good the defects of careless workmen if not of dishonest builders.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute was held on Monday, Mr. Ernest George, A.R.A., in the chair. A paper was read by Mr. Edward Warren, F.S.A., F.R.I.B.A., on

### The Life and Work of George Frederick Bodley.

The task of writing a paper on George Frederick Bodley was rendered both delicate and difficult by the fact that for over twenty-five years he worked in partnership with Mr. Thomas Garner. It is always difficult, where an estimate of individual character is sought, to deal with the outcome of such collaboration, and to apportion to each his due meed of influence and of creative industry. Mr. Warren said he entered upon the task with the qualification that he had enjoyed a long and close friendship with both partners.

Mr. Bodley's life was best divided into three periods: the youthful initial period of training and of individual work, the middle or collaborative period, and the final one of reversion to single practice. It was no derogation of the high talent, marked ability and extraordinary industry of Mr. Garner to say that if the career of Mr. Bodley had to be considered as single and unassisted his title to distinction would hardly be diminished.

### *The Initial Period.*

George Frederick Bodley, who descended from the family of Sir Thomas Bodley of Oxonian fame, was born at Hull in 1827. His father was a physician of considerable repute, and his mother (to whom he ever attributed the decisive influences of his life) had unusual attainments.

While still a boy they moved to Brighton, and it was there that George met Sir Gilbert Scott, whose pupil he subsequently became, incited to that course by reading Bloxham's "Gothic Architecture."

To Sir Gilbert he served an apprenticeship of five years, living in his master's house in Regent's Park. He found his early studies and employment in the office rather dreary. He did not take kindly to the dry and academic expositions of Classic architecture, and of the "Orders," but his enthusiasm revived with employment upon drawings for Gothic buildings, such as setting out the arcades of St. Michael's Church, Great Peter Street, Westminster.

Unlike many, if not most, work came to this young architect almost at once upon the expiry of his apprenticeship, and his first commission was to add an aisle to a church at Bussage, Gloucestershire, for Thomas, the brother of John Keble. This was followed by a constant flow of work, almost entirely upon churches.

Drilled in a somewhat rigid convention of English Gothic, he, not unnaturally, began his independent career with a revolt. This is very evident in his first complete church, that of St. Michael, at Brighton. Tired of the formalised versions of English thirteenth and fourteenth century styles, he designed this church in an extreme severity of form and detail, and with a character suggesting the Early French rather than the Early English type.

Within the next few years he was constantly and happily busy with new churches—St. Martin's at Scarborough is one of the most interesting, not only for its intrinsic beauty and distinction, but for the fact that the architect found a field in the decorative accessories for the co-operation of his pre-Raphaelite friends and fellow enthusiasts, Rossetti, Madox Brown, Stanhope, and again William Morris.

For the first few years Mr. Bodley's small but steadily maintained practice seems to present almost ideal conditions for a young architect. He lived with his mother in Harley Street, where he worked single-handed, or with occasional assistance only, for several years. Commissions came at comfortable intervals, leaving time for self-culture and the pursuits he liked best. He detested competitions, which were essentially opposed to his quiet reflective nature and abstract idealism.

As work increased he turned to his friend Thomas Garner, who had followed him as a pupil in Scott's office, and who was developing a small practice in Warwickshire. Mr. Garner at first worked as an occasional assistant.

### *The Middle Period.*

As we near the middle or partnership period, we perceive that a marked change has been taking place in Mr. Bodley's handling of Gothic architecture. The French feeling has waned, and the type has become more determinedly national.

The austere simplicity gave way to a more suave severity, and an increasing use of mouldings, always softly curved, of engaged shafts and curvilinear tracery, rapidly led to the fully evolved version of English fourteenth century Gothic which became Mr. Bodley's characteristic manner.

This period is, unhappily, marked by a great physical misfortune. He was stricken with a long and painful illness, arising from blood-poisoning, the result apparently of an inspection of fetid burial vaults at Louth. He had to keep his bed for months, and left it with his black hair turned white, and crippled for life by lameness.

The first long period of illness, however, obliged him to seek and to rely upon the capable assistance of Thomas Garner, and thus led directly to recognised collaboration. A formal partnership was entered into in 1869, and amongst other work which it immediately shared was the church, initiated by Mr. Bodley, of St. John, at Tue Brook, Liverpool, a church of distinctly English fourteenth-century character, not elaborate in structural detail, but very elaborately furnished and decorated. No detail has been overlooked. In the enthusiastic, scholarly and patient completion of every accessory of a church interior Messrs. Bodley & Garner stood in the early 'seventies absolutely alone; and it is to their example that the greatly increased attention now bestowed throughout the country upon such accessories is due.

The Tue Brook church was soon eclipsed by two others, which still remain pre-eminent amongst the many by the same architects. These are the Holy Angels, at Hoar Cross, Staffordshire, 1871, and St. Augustine, at Pendlebury, near Manchester, 1873. Though stamped with a kindred inspiration these buildings are utterly different in form and character.

No indication of their mutual work would be complete without notice of the considerable collegiate work at Oxford and Cambridge. In Oxford they made their beginning and their mark at Christ Church College, with additions to the library, and the great tower at the south-eastern corner of Tom Quad, that rises over the splendid old staircase leading to the hall. It was no easy task to hit the happy mean of height and mass for a tower that should neither do hurt to the fine proportions of the hall, nor lessen in effect the low spire of the cathedral.

St. Swithin's Quadrangle at Magdalen College was entrusted to them, after a competition, in which Messrs. G. E. Street and Basil Champneys of London, and Mr. Wilkinson of Oxford took part. The quadrangle has not yet been completed.

If at Oxford Mr. Garner bore the lion's share of the work, Mr. Bodley redressed the balance at Cambridge. At Cambridge Mr. Bodley added new and distinct buildings to two colleges—"King's" and "Queens'." At the former he has placed, on the river front, facing the "Backs," the incomplete quadrangle known as Bodley's Buildings.

The years between 1870 and 1880 produced many other designs, and amongst them those of two cathedrals—one the unsuccessful competitive design for Truro, and the other that for Hobart Town, Tasmania, which has been carried out, and is a candidly English design in the typical manner of its authors. The period between 1880 and 1885 was a busy one for the partners.

1886 brought Mr. Bodley an opportunity similar to that at Hoar Cross. This was the church designed by him for the Duke of Newcastle at Clumber, near Worksop. It is very similar in style and feeling to its Staffordshire rival; externally, if anything rather plainer, and with less emphasis of vertical line, it conveys an equal sense of easy security and instinctive proportion.

Clumber Church indicates a cessation of the real collaboration of the partners. For several years before the actual severance of the tie, it had become practically nominal, and though intimately friendly and sympathetic, had ceased to have its former significance; each partner worked singly upon a given design with bare consultation of the other.

The actual cessation of partnership came in 1898, by the friendly dissolution of a friendly bond—there had never been any deed or legal document of any kind—and they continued their dissociated labours side by side in the two old sets of chambers on the first floor of No. 7 Gray's Inn Square.

### *The Final Period.*

In the years between 1885 and 1895 many new churches, large and small, in town and country, were begun and completed by Mr. Bodley—Eckenswell, Horbury, Skelmanthorpe, Warrington and Danehill are all small churches, the last of singular beauty and perfect adaptation to its site, on a Sussex hilltop; Epping, Hackney Wick, Norwood, Branksome, Bournemouth, and Cowley, Oxford, all town or suburban churches, are of considerable size.

Mr. Bodley was frequently employed upon the repair and readornment of old churches, or the more or less complete alteration of modern ones. In regard to the former, he hated "restoration" of the fabric, and generally confined himself to mere repairs and to complete furnishing of the interior. He handled old buildings lovingly.

With a modern church—of the early nineteenth century Gothic type—he was scarcely tender, though he respected anything of good architectural character. Some of his conversions, or "transmogrifications," are remarkable.

In ecclesiastical work Mr. Bodley adhered, if possible, to his own version of Gothic; but in civil or domestic work, except in collegiate work, he worked always in equally personal and varied versions of the English Renaissance.

His strong leaning, however, was always towards Gothic. It was a matter of faith, of profound personal conviction, in which to the end he never wavered. His later designs all show its intensity.

One of his last churches, if not the very last upon any considerable scale, is Holy Trinity, Kensington. The thinness of effect in his last works was, at any rate, partly due to the fact that his increasing infirmities made visits to his buildings less frequent, and that he grew to rely more upon drawings and to realise less acutely their realised effect.

Great honours and great opportunities came to him very late in life; one of the greatest opportunities indeed close at the end. In 1906, the year before his death, came the commission to design Washington Cathedral, in conjunction with his old friend and former assistant Henry Vaughan, of Boston. This was quickly followed by the placing of the cathedral of San Francisco in his hands. In 1906 he journeyed to the United States to inspect the sites and to make preliminary arrangements. Upon his return, and while employed upon yet another remote cathedral—in India—he at once began the designs for Washington and San Francisco. He was much hampered by ill-health in the following spring, but managed nevertheless to complete his designs. He was destined never to witness even the actual beginning of the American buildings, but left the drawings in a well-advanced stage of preparation. The United States had done him previous honour by bestowing upon him the gold medal of the American Institute. A similar honour was done him in 1899 by the R.I.B.A. He was elected Associate. In 1907 he received from Oxford the honorary degree of D.C.L. He died suddenly and peacefully on the evening of Sunday, October 21, in the old manor house of Water Eaton, near Oxford.

No just estimate of his character or attainments could be formed without intimate acquaintance, and he was not easy to know. He did not as a rule make friends easily or quickly, but once made he retained them, and their number was not a few. To his many pupils and assistants he was delightfully friendly and inspired admiration and respect in all, and in those who knew him best the warmest affection.

His success owed nothing to business habits, for a worse man of business in the usual sense it would be impossible to find. He detested accounts and kept none; he detested business letters, and frequently delayed answers to important communications—when he answered at all—for weeks or months. Mr. Bodley was not only a master of his art, but excessively masterful. He has been called a copyist. Nothing could be further from the truth. As a pupil he had sketched but little, in spite of constant urging; in his later years not at all. His method of studying an old building was, as regards the exterior, to borrow a chair, which he carried from point to point during the contemplative smoking of a cigar; when the cigar was out, he went inside and continued the contemplation. Yet he would remember the building, even to its details, for the rest of his life. He regarded drawing for an architect as solely a means to the realisation of his design, and to that end his drawing was always adequate. For neat and finished drawings he had small regard, and no patience in his later years for their preparation. His first notes of his various conceptions for a plan, or some large detail, were made anyhow and anywhere. He had an extraordinarily fine sense for curves, and hated a weak or a flabby one. His injunctions to his staff were always in the direction of refinement and restraint. "Learn to leave out. A young architect's india-rubber is more important than his pencil," he once said; and again, of window tracery, "It's not the shapes you make, but the shapes you leave, that matter."

In placing a building in a street, or in contiguity to others, he was always careful to do no hurt to its environment. "You must consider your neighbours," he said; "you've got to be a gentleman in your art."

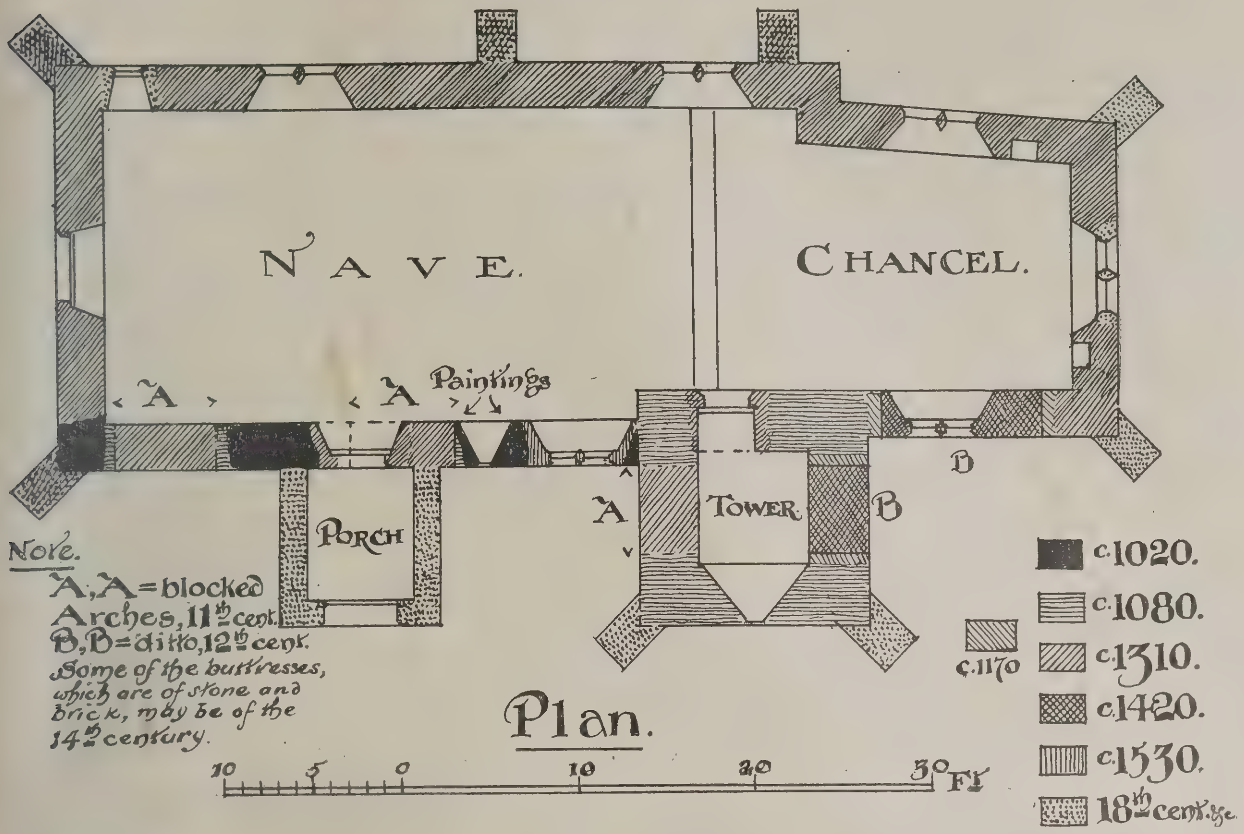
He never faltered from his ideals; he had ever the courage of his opinions; his enthusiasm and his energy endured to the end.

Previous to the opening of the discussion a letter was read from Professor Simpson, one of Mr. Bodley's earliest pupils, who was prevented from attending by an attack of influenza. He said that Mr. Warren's paper was so complete that little was left to be said. Mr. Bodley was, he believed, Sir Gilbert Scott's first pupil at the time that Street was his first assistant. The low but bulky tower at the corner of the Tom Quad, mentioned by Mr. Warren, was to have been covered with a lantern somewhat on the lines, but not a copy, of one on the belfry at Calais. The lantern is shown in some of the measured drawings, and also in a water-colour perspective made by Mr. H. Brewer. This intention accounts for the lofty proportions of the angle turrets which rise above its parapet and appear in consequence too high—or so Mr. Bodley thought. As Mr. Warren remarked Bodley was not business-like. He would keep clients waiting for months. Years ago when Professor Simpson was measuring up a curious chancel arch in Great Bardfield Church, Essex, the clergyman said that he had been waiting for a design for a reredos which he had asked Mr. Bodley to make considerably over a year previous. Professor Simpson mentioned this when he returned; but no design was sent during the six months or more that he remained in Bodley's office.

Mr. G. H. **Fellowes Prynne**, in proposing a vote of thanks to Mr. Warren, said that he rose with the greatest possible diffidence and with the greatest possible pleasure. The paper was distinguished as being the appreciation of a loyal and devoted pupil. Bodley's buildings were marked by an exquisite charm and proportion and delicacy of detail. The gentle loving treatment of his restorations all tended to mark him out as essentially a man who loved his work and studied every detail of it. But first and foremost one must think of him as a man of great courage who broke away from the example of his predecessors, and as one whose work was no slavish following of what had been done before. His genius and sympathy for colour was shown in almost every church. Such details as the decoration of his walls and every detail of his embroidery were marked by the intense care he lavished on them. The phrase "Bodley's colours" is synonymous with all that is quiet and harmonious. Unhappily we seem to have lost our love and power of appreciation of colour, and those who try to use it very often find prejudice and bigotry against them. How very different to the past, when our churches were warm with colour. No individual's efforts to introduce it again were more successful than those made by Bodley. Bodley seems to have been fortunate in many ways; as a young man he mixed with those who were intensely enthusiastic and whose aim was high. He was also fortunate in his clients. The loyalty of his pupils was remarkable. There was one feature that Mr. Warren did not touch upon, and perhaps, rightly, viz., the fact that Mr. Bodley, like all the best ecclesiastical architects, was an ardent churchman. There is hardly one of Bodley's churches which is without spiritual inspiration and that indefinable feeling that church architecture is raised to the highest pedestal of the art of architecture. It enriches the creator and the spectator.

Mr. **Walter Tapper** said that one thing about the paper that struck him was the dominant note of love and reverence that ran through the whole of it, and which was echoed in the hearts of every one of Mr. Bodley's pupils. With reference to the feeling that Mr. Bodley could not draw, it might be said at once that he could not draw in the sense that we understand it nowadays. No elaborate drawings came from his hands. But it was only necessary to look at his sketches to see what a tremendous artist the man was. Bodley once said that it was not what the architect put on paper, but what he put on his brain that mattered. The medium that Mr. Bodley used to express his idea on paper would not appeal to most men, for it was really anything that was at hand. The love and reverence that his pupils felt for him was not to be wondered at, for, said the speaker, the eighteen years that he was with him he had never heard him say an unkind or angry word. The buildings themselves were the justification of this great man's mind.

## Church of St Edmund, King & Martyr, KINGSDOWN, nr Farningham, Kent.



Mr. Maurice B. Adams said that he had known Mr. Bodley for a great many years, and taken the greatest interest in his work. His first church at Brighton was built on a most difficult site. Although it was an extremely sloping one the building had an extraordinary air of massiveness and repose. The west end of this vast breadth of brickwork was somewhat relieved by the streaky bacon style.

A vote of thanks was passed by acclamation to Mr. Warren.

## EARLY WALL-PAINTINGS IN KINGSDOWN CHURCH, KENT.

At a meeting of the Royal Archæological Institute on February 2, Sir Henry Howorth, D.C.L., K.C.S.I., in the chair, a lecture was delivered by Mr. Philip M. Johnston, F.S.A., F.R.I.B.A., on the "Discovery of Early Wall-Paintings in Kingsdown Church, Farningham, Kent." Coloured full-size tracings as well as photographs were placed round the room, and the lecture was extensively illustrated by lantern slides. Mr. Johnston began by dealing with the church generally, which, he said, up to the present time had been known only for its ancient glass. Winston's "Enquiry into the Difference of Style Observable in Ancient Glass Paintings," published in the forties, mentioned it; and Mr. Johnston mentioned that he had himself visited the church ten or twelve years ago for the purpose of seeing these valuable fragments of early fourteenth-century glass. But the immediate object of his paper was not the glass, but the exceptionally ancient paintings brought to light during recent works of repair.

About April or May of last year the present rector, the Rev. F. W. Warland, was carrying out some extensive repairs in the church, and in the course of these the workmen laid bare a curious rude window-opening of small size in the exterior of the south wall. Mr. Warland then made careful search for the splays of this window on the inner face of the wall, and after carefully measuring the two faces he removed the modern plaster and the rubble with which it was blocked up, and brought to light some remarkable paintings.

On plan the church is a curious one. The south wall may with confidence be assigned to the early part of the eleventh century, one proof being the peculiar coursed rubble of which it was constructed. The original church probably extended as far westward as at present, and consisted simply of a small nave and chancel. In the second half of the eleventh century a tower was tacked on at the junction of the nave and chancel on the south side. The church was rebuilt, with the exception of the south wall and the tower, about A.D. 1310, at the expense of the De Lucys, who have left their portraits on the terminals of some of the dripstones. The paintings must have been hidden from about 1080 A.D. They were never subjected to the customary coating of whitewash, and they retain to this day their pristine freshness and vigour. Mr. Warland has taken the proper steps for their preservation. The window is on the outside quite different from the ordinary window formed of Norman stonework, and the arch is typical Saxon stonework (?). The window is only 6 inches in width and was never closed.

The dedication of the church to Saint Edmund, king and martyr, is presumptive evidence of a Saxon origin for the church. He was, of course, very much reverenced in early times in this country as a double champion, first of the Saxons against the invading Danes, and secondly of Christianity against the heathen. From 870—the year of his martyrdom—the memory of Saint Edmund was much treasured, and a large number of churches were built in his honour, one being in the heart of the City of London in Lombard Street. It was a curious coincidence that, while Kingsdown Church stands in the middle of a wood, so many of the legends connected with St. Edmund have to do with a wood, as, for example, that about the gaunt grey wolf which was found guarding the Saint's head. There was no reason to doubt that at the time of its erection this primitive church must have stood in an extensive wood. Then again there was a strong probability from the name "Kingsdown" that the place was Royal property in very early times, and that a Saxon monarch may have built the church.

These may have been some of the reasons for the selection of a martyrdom scene for the paintings upon the splays of the window in the south wall. On the eastern splay are figures of Abel, with his offering of a lamb (a curiously rat-like animal), and of Cain, carrying his sheaf of the fruits of the earth. Between them is a mound of some combustible material bursting into flame, in place of the altar that one would have expected to see. On the western splay we have the straightforward subject of the martyrdom of Abel at the hands of Cain. Cain is represented as an evil-looking man with rolling eyes. He has delivered one knock-down blow, and places his left foot on his brother as he lies on the ground.

When the paintings were first laid bare one of the parishioners hazarded the speculation that the western splay showed Samson killing the Philistines with the jaw-bone of an ass. The object shown is probably intended for an ox's jaw-bone. There was a well-defined tradition that Cain picked up the jaw-bone of some animal with which to kill his brother, perhaps thereby intending to add insult to injury, as his offering of the fruits of the earth was refused, while Abel's offering of the lamb—an animal—was accepted. This tradition was embodied in the mediæval miracle plays with which Shakespeare was perfectly familiar, and it is interesting to note that in the Grave-diggers' scene (Hamlet, Act V., Scene 1) he makes Hamlet say:—

"That skull had a tongue in it, and could sing once: how the knave jowls it to the ground, as if it were Cain's jaw-bone that did the first murder!"

There can be no question that the weapon wielded by Cain is a jaw-bone retaining the teeth. In an illuminated MS. at the British Museum there is an illustration of a similar subject, and at the foot of it there is an inscription to the effect that it is Cain murdering his brother. It also appears as one of the panels in the bronze door at Verona, which was perhaps a century later than these paintings. In the Italian representation Cain is striking his brother with a mattock.

One curious point about the paintings, said Mr. Johnston in conclusion, is the way in which they have been executed. A thin coat of whitewash was first applied; on this the artist outlined his figures in pale tints, and lastly put on his red and yellow ochre. The artist did not complete his work then, but resumed it after a short interval. Presumably he was in a great hurry, for there are splashes of colour all over the surface. It was then that the background was introduced.

Since their discovery last year the paintings have been sprayed with Professor Church's solution, as being the safest system, and they appear to be standing extremely well.

## THE SOCIETY OF ARCHITECTS.

A MEETING of the Society of Architects was held on Thursday, the 10th inst., at their premises in Staple Inn Buildings, W.C. Mr. J. W. Dyson, vice-president, in taking the chair, said that all who were present would regret that Mr. George E. Bond, their President, had been forbidden by his doctor to attend that meeting in consequence of a severe cold. He also had very much regret in announcing the death of Mr. Robert Walker, J.P., of 17 South Mall, Cork. As he was such an old and esteemed member of the Society of Architects a vote of condolence would be sent to Mr. Walker's family

Miss Lorrie G. Dunington then read the following paper on—

### Garden Planning in Relation to the House.

The subject of my paper to-night is so vast that I feel I cannot do more than touch lightly on a few salient points connected with the art of garden planning.

The true beauty of the garden is dependent on three main conditions, all of which are indispensable:—(1) Excellence of design; (2) Suitability of material; (3) Harmonious planting.

I propose taking these points in order, but before doing so, it will not be out of place perhaps to go back a few centuries and trace out the various agencies which have helped to make and mar our gardens of to-day. Let us first consider by what reason does a garden exist? Is its origin to be found in religion, utilitarianism, or mere æstheticism? Is it subservient to, or independent of architecture?

In contemplating the history of the human race and its gradual evolution from primitive man up to that product of sociology and education which marks the progress of our own times, we find that the art of gardening like that of architecture follows closely the wave line of advancing civilisation.

Passing over the somewhat hypothetical records of that allegorical paradise, the "Garden of Eden," and confining ourselves to such meagre historical facts as are at our disposal, we turn instinctively to the East for the birth of gardening. Ancient Egypt supplies the prototype of modern Western architecture, and since gardens have ever been associated with buildings, the question arises, What primeval motives prompted their construction? We read that many of the tombs and temples of Egypt preceded secular buildings This seems to suggest that some simple religious inspiratio or unexpressed idealism was responsible for the first ste towards the awakening of the consciousness of art.

Archaic architecture might almost be regarded as a compilation of local materials arranged conveniently to meet th need for which they were intended. That is to say, the form construction and decoration of the building were the direc outcome of the materials used. Therefore, modifications i style were the result chiefly of the importation of ne materials as well as the evolution of ideas.

The Egyptian temple, though of massive stone construction, probably drew its inspiration from nature. The hi locks of sand rising out of the desert may have suggested it form, and the reed and the lotus its ornamentation Although the stone of which these temples were built wa not always found *in situ*—on the contrary it was frequentl brought from a great distance—still its universal adoptio gave rise to a national and racial style, and a uniformit approaching that of localism.

Surrounding these buildings of severe and rectangula outline were the first gardens of which we have any definit record. Their primary object was probably to serve as barrier to keep at bay the ever encroaching sands of th desert. Further than this, they provided shade from th scorching rays of the sun and seclusion from the eyes of th curious. The fertile and irrigated land which they con prised was used by the priests for the growing of plants f use in religious ceremonies. In design, these gardens we essentially formal, often little more than a mere repetiti of straight lines, yet they were suited to their purpose, ar were at least in harmony with the buildings they encor passed. They were, in fact, veritable oases in the desert wi their tanks of cool water, fresh green turf, and rows slender cypress. Nor were they without their arbours ar trellises. The avenues of sphinxes which lined the ma entrances to the temples were religious symbols and probab had nothing to do with garden design, though they may ha suggested the introduction of statuary into the gardens Greece and Rome.

Thus we see that gardens in their origin were made to co form to the lines of the building, and were entirely s servient to it. Their first object was utility, and the deg of their æstheticism was indicative of the state of civilisati at the time. Abstract beauty is not greater to-day than was then, but by the unfoldment of ideas man has gro more conscious of its presence, and, therefore, is capable giving it greater expression. So true is this that one c form a correct conception of the moral and intellectual c dition of a nation by studying its art and architecture. is not within the scope of my paper to-night to hold a br for the ethics of pagan art, but most thoughtful people m admit that there was a truth and nobility about it wh could only have originated under the influence of div inspiration.

With the further development of art, gardens became necessary adjunct of voluptuous public and domestic arc tecture. Pleasure grounds of considerable extravagance s rounded the palaces as well as the temples, and by the t gardening had spread westward to Greece and Rome, original purpose was obscured by a reckless expenditure wealth and an overwhelming indulgence in sensuous livi Gardens were regarded as a luxury, and were almost enti confined to the rich.

There is every reason to suppose that the villas built England during the Roman invasion possessed garde formal in design, and similar to those of Rome itself, tho less pretentious. Owing to the subsequent invasion of barians, no evidences of these gardens now remain; houses, on the other hand, being of more permanent struction, are still traceable in various parts of the coun With art once again at zero, in as far as Britain was cerned, we were forced to turn to religion for its revi Christianity fostered and spread the garden which was more rigidly utilitarian and less æsthetic than its Egypt ancestor. Treading on the heels of this revival came peace and prosperity which resulted once more in arti extension, and in gardens for pleasure as well as for But it is interesting here to note that the usefulness of garden has never since been lost sight of, and the most suc ful twentieth century garden is the one which displays greatest amount of usefulness combined with beauty, an saying this, I must disagree with the poet who wrote

"Be its beauty
Its sole duty,"

unless I may be permitted to render this as meaning all true beauty is inseparable from utility.

If precedence alone could give superiority to one over another, then the formal design holds an unassailable position. Anywhere between 2000 and 4000 B.C. up to the beginning of the eighteenth century, formality stamped and governed the planning of the gardens of the Aryan race. With the Mongolians it has been different, and it is stated that it is to China we owe the introduction of the so-called "Natural" style which has played such havoc with our traditions and swept away so many of our beautiful English gardens.

The art of garden design in England was at its zenith during the seventeenth and early eighteenth centuries. Never before had there been gardens of such excellence in this country. The peaceful old manor-house garden of the sixteenth century was insufficient to meet the demands of the public which was then feeling the influence of the Italian Renaissance, and the new ideas from the Continent wrought many changes in the English home and court circles. Yet something more than improvement of design was responsible for this sudden uplifting of garden craft. Previous to this, it had been customary for the architect to design both house and garden, and the result was good up to a certain point. There was a general harmony of expression and unity of purpose between house and grounds which could not fail to be reposeful and pleasing in effect. But a change was coming over the public mind. The science of horticulture was advancing with equal rapidity, and owing to the very numerous introductions of exotics, the materials at the disposal of the gardener were greatly enlarged. People began to take a keener interest in flowers, trees, and shrubs, and the garden became something more than a formal enclosure brightened haphazard by a limited number of old-fashioned flora. The garden of the future was to depend not only on architectural design, but also on the plants and trees it was intended to contain. Here was a difficulty to be overcome. The architect's knowledge of horticulture was not sufficient to meet the case, neither was the ordinary gardener competent to undertake the planning in addition to the planting. It was at this point that a French school of garden design came into existence with Le Notre at its head. Here we had the horticulturist sufficiently trained in architectural design to enable him to plan the "lay out" in sympathy with the building. I need not dwell on the causes or effect of the decadence which followed this period of brilliance, and which lasted for over a century. Suffice it to say that we are at this present moment undergoing to a certain extent a revival of that lost splendour. But we are accomplishing more than that. "Times change and we with time." The greatest beauty the seventeenth century had to offer would not satisfy the twentieth century public. This is perhaps a bold statement to make, and the upholders of the "good old times" are possibly ready to dispute it. Humanity cannot for ever be supported by the memories of a past success, but rather should use it as a stepping-stone to higher achievements. The reason why the seventeenth century garden would not meet modern requirements is because we have outgrown it, just as the seventeenth outgrew the sixteenth century work, and to revive it in its entirety would be a retrograde step. The tangled and often empty flower borders of a former age would not be tolerated to-day by those fastidious gardeners who demand leaf and blossom in unbroken succession for nine months in the year, and even the midwinter months are made to produce a modest contribution to the floral feast.

In England, at least, a garden continues to mean to most of us, an enclosed retreat. A place for rest and mental refreshment, where we can enjoy, unobserved, the pure enchantments of nature. Its value does not lie in the intricacy of its design, nor upon the money expended on its construction, for beauty is no more a slave to wealth than is happiness. The modest cottage garden is frequently more soul satisfying than its more pretentious neighbour within the park gates. On the other hand, the designer must bear in mind the extent of his client's purse when preparing his plan, for although, as we have seen, beauty transcends monetary considerations, yet the successful designer is a practical man as well as an artist. It is easier to bury gold unseen in excavations for a garden than in the bricks and mortar for the house, and what appears at first sight to be an inexpensive design may in reality prove a most costly one. Simplicity is seldom cheap in this world.

It is impossible to lay down any hard and fast rules regarding the planning of grounds. Each site suggests its own requirements, and each building its setting and style. But broadly speaking, the skill of the designer lies chiefly in making the most of existing features, in the overcoming of difficulties and in preserving a sense of individuality untainted by affectation.

The most successful lay out is the one which, when finished, looks so obvious and unobtrusive in arrangement that it would be difficult to picture it otherwise. It is in short the one which frequently calls forth the least praise from the uninitiated. There are some who, in their endeavours to produce a faultless design, will at start uproot every tree on the estate, exalt every depression, and lay low every mound, but what they gain by the abolition of a few obstacles does not compensate for loss of character and feeling. Any departure from convention is permissible, providing that the reason behind it is a good one. This is especially true of the remodelling of an existing garden of some maturity. Any who have undertaken such a task will have found innumerable hindrances to the carrying out of preconceived ideas. The size of the forecourt, the length of the paths, the width of the terraces, all may have to be readjusted in order to preserve some fine old timber or rare shrub. The "clean slate" method is undoubtedly the easier, but the inevitable sacrifice which it entails lays it open to just condemnation. Even when dealing with a new site, the designer should weigh carefully in the balance the removal of a single tree.

It is essential to pay considerable attention to the main entrance to the grounds from the road, as it is here that the visitors gain their first impression of house and garden. The drive and forecourt should be quiet and subdued in design, with just sufficient well thought out colour to suggest cheerfulness and good taste. Anything approaching ostentation should be strictly avoided. But when we come to deal with the garden proper, we can allow ourselves a greater licence; colour must abound, and the design, now less restricted, should offer peace and pleasure for every changing mood.

Garden planning does not begin and end at the draftsman's table; indeed, that is the least important part of it. A house may be designed for to-day, and is complete when the last labourer has left it, but we make gardens for a future generation. We only begin the "lay out," others carry it on and the work is never done, and fifty years of neglect will obliterate it from the face of the earth. Half the materials we use are inanimate, and the other half are living, and, therefore, ever changing. Who shall say that Bacon was wrong when he called gardening a more difficult art than building?

The overcrowding of ideas is the commonest fault of the beginner. Most plans from the 'prentice hand contain sufficient special features for half a dozen gardens. Moreover, a garden is not an architectural museum. It can be in perfect harmony with the house and still be devoid of masonry and statuary, and unless the latter be really good, it is better absent. There are few who realise to the fullest extent the value of a well-formed grass bank of geometric design, or who are conscious of the exquisite charm of the shadows it may cast in sunlight.

Gardens, being less permanent than buildings, are more influenced by passing fashions. At the moment no garden is considered complete without a "pergola," and so with a happy disregard of all laws of design and good taste, we see this unfortunate alien from Italy erected in almost every plot of ground large enough to take it. If there be no south slope available for it and its roses and vines, then it is placed on the north and covered with ivy. A sad and useless object leading from nowhere to nowhere. The sun dial is another feature much misused. Savouring of a past age, it suggests itself as a centre piece for an old-fashioned formal garden. Yet, how often do we see it set up in "Suburbia" with nothing to link it to its surroundings. But still more incongruous is it when one meets it in the forecourt of a public building, or in a London soot laden garden.

### *Materials.*

We have already seen that materials produce style. This is true not only of buildings, but also of gardens. All architectural introductions into the garden should be, as far as possible, of similar materials to those used in the construction of the house. This may appear a mere platitude, and yet we not infrequently meet, in otherwise well planned gardens, an absolute dissimilarity of materials.

Wherein lies the charm of a Surrey pine wood garden? It certainly owes a deep debt of gratitude to both Miss Gertrude Jekyll and Mr. Lutyens, but even their joint skill could not have produced so distinct a style had they not had the assistance of local materials. Where would the Munstead gardens be without their Bargate walls and their pine and chestnut copses? With the house built of stone, quarried probably on the site, garden walls to match, paths of sand and flower beds of warm, light earth, what could be more harmonious in its conception? But what is suited to the Surrey pine woods would be out of place on the chalk downs of Kent, or the clay of Middlesex. If the house be of London yellow brick, then let yellow brick form the garden walls and steps. To import stone or other materials of greater refinement would be to accentuate the mediocrity of the building. In these days, however, of easy transit by road and rail, few people care to preserve a local style by the use of materials close at hand. They choose their gardens much as they do their carpets, by consulting a pattern book. Their fancy is caught by a fashion and they succumb. The house is for the time being forgotten, as are also the surrounding conditions. Nor does the folly end here. Affectation creeps in in many subtle ways. At the present moment there is a revival of the gardens of a couple of centuries ago. There is a desire to reproduce ready-made antiquity. What is more delightful than a walk paved with old York flag stones? Age has mellowed and frost and rain broken it asunder. Vegetation has sprung up in the crevices and the whole is sweet with memories. Compare this with the handiwork of the modern man who first lays a discarded London flagstone, and then shatters it to bits with a hammer that it may present a crazy as well as an antique appearance. Will these paths we so construct live to be a joy to future generations? I think not. This is what I mean by retrogression in garden craft. Another idiosyncrasy of the hour is the collecting of dilapidated wrought iron work in the form of gates, railings and screens. Each age has produced its bad art as well as its good, and antiquity alone is no criterion of excellence. Because a gate was wrought a couple of centuries ago it is not necessarily worth looking at.

This last point I will touch upon but briefly, and it shall be more of the nature of a plea for greater attention to this branch of garden craft. Of what avail is a design, however beautiful on paper, if it is unsuited to the successful growing of flowers and trees? Materials control design. How then can anyone design successfully if they have no knowledge of the materials which are necessary to carry out their ideas?

Trees and shrubs used in garden making fall under two headings:—

1. Those used architecturally, when they supplant more permanent materials, but at the same time are made to fulfil the same duties. Here we include the clipped hedge of yew or beech, the trim edging of box, the pleached alley and the topiary tree. To class these as unnatural, and therefore unsuitable features, is scarcely a fair criticism, since they are not intended to replace trees of natural growth, but act as foils to them. Most people will admit that the herbaceous border never looks so well as when backed by a wall of sombre green, and that the terrace gains much by the judicious use of trees of formal outline.

2. Under the second heading we have trees, shrubs and flowers used exclusively for decorative purposes, and these are allowed to grow more or less as nature dictates. At the same time, due attention should be paid to the artistic grouping of colours, the value of light and shade and the planting for bold effect; and it would seem that this is worthy of special study, in order to bring out the fullest possibilities of the garden. With higher ideals before us and an increase of knowledge and experience, we can look forward to achievements greater than those of the seventeenth and eighteenth century masters.

At the conclusion of the paper a series of views of English gardens was thrown upon the screen.

Colonel F. S. Leslie, in proposing a vote of thanks, remarked that it was to the best of his recollection the first occasion on which a lady had lectured to the Society of Architects. They were sometimes told that ladies had not logical minds but this was not correct, one proof being afforded in Miss Dunington's paper, which had been well arranged and logically reasoned out.

Mr. Rogers said that speaking as a stranger and not even as an architect, he had to confess to some ideas which were not usually accepted, although obtained as the fruit of some little experience. With the paper itself he felt in entire sympathy; the subject had been presented in a logical way and most of its principal points dealt with. He took it that Miss Dunington, like himself, was in favour of formal planning up to a certain point. The outlines of a garden should be considered more or less as a receptacle for what was going to be put in it, also the vertical plane had to be taken into account. Few garden designers pay sufficient attention to the question of aspect, though it ought to be one of the controlling features. A great many designs, furthermore, err on the side of being planned on too symmetrical lines. With regard to pergolas, they were delightful things provided they were covered and provided they led somewhere. Paths also should lead somewhere, even if only to a summerhouse.

Mr. Dyson, in concluding the discussion, said that he had been always led to believe that a gardener's year was made up of nine months of very hard work and three months of disappointment. But this latter could hardly be true judging by the very successful results shown to them on the screen.

## ICONOCLASTIC TOWN PLANNING.

We are not altogether in accord with Professo Adshead's views expressed in a paper read befor the Manchester Society of Architects as to the ruthles treatment of mediæval antiquities that he would be pre pared to adopt in carrying out a scheme of town planning "To effect a street widening he would have little scruple after photographing and measuring, in demolishing a half tumbled down erection which had no other plea for preser vation than that it was picturesque and built of goo English oak. He felt that they were inclined to exaggerat the architectural value of much of the mediocre work of tha period and to underestimate the value of work erected sinc the time of Wren and previous to the middle of last cen tury, an age which contained a wealth of traditional form which even the most pronounced progressive movement of to-day could not afford to ignore." This is followin the bad precedent of the Gothic "restorers" of the nine teenth century, with the variation that fashion havin changed with the swing of the pendulum, Profess Adshead would clear away mediæval work and save tha of the eighteenth century. One-sided enthusiasm and mi guided zeal have ever been the causes of iconoclast excesses, and we are not all prepared to be Haussmannise in the "grand manner" because this is the penchant the Liverpool school.

Mr. Adshead, as our first Professor of Town Plannin should at least be aware that there is a school of qui modern town designers in Germany who at least ha decided claims to respect for their views, and who ho that the mediæval manner of town planning is worthy be followed in the twentieth century. Surely a Profess of Town Planning who cannot or will not teach students to make the most of the opportunity that an o building, even though mediæval, gives for a pleasing pie of design has mistaken his mission.

The Eternal City is even now apparently destined to fate to be deplored by all lovers of art from the putting in effect of the views Professor Adshead has expresse Signor Nathan, the Syndic of Rome, and his Council ha triumphed over Commendatore Boni, and the Zona Mon mentale is to be a boulevard and nothing more, instead being an object-lesson of the greatness of Imperial Rome

If civic planning means no more than the driving wide boulevards with occasional squares through existi towns or even slums, anyone with a parallel ruler can come a Professor of Civic Design and remodel our ma Heaven save us from the banality to which our first a only Professor—at present—would appear to conde us. There are, however, we believe, many who love a admire such towns as Nurnberg, Rothenburg and Rege burg, to say nothing of Chester, Coventry and Shrewsbu and we do not fancy that the Professor Adsheads a Signor Nathans will always triumph.

## ILLUSTRATIONS.

### PUBLIC HALL AND BUSINESS PREMISES, LLANELLY, SOUTH WALES.

This building is designed by Mr. H. P. Bu Downing, F.R.I.B.A., for an island site close to Town Hall, at Llanelly, and will be built of red bricks Portland stone, with Delabole slates for roofing.

### CATHEDRAL SERIES, LLANDAFF.—SOUTH NAVE AISLE, FROM EA

This view is in continuation of our series fr Llandaff Cathedral which commenced in our is of January 7.

### THE CHAIN GATE AND GALLERY, WELLS CATHEDRAL, SOMERSE

The plates of large scale details of the mouldi complete our illustrations of the measured drawi by Mr. John Th. Westbye.

# RENAISSANCE CHURCH ARCHITECTURE OF THE SIXTEENTH CENTURY IN FRANCE.*

*(Continued from last week.)*

AFTER my remarks on the conservative tendencies of religious architecture it may appear somewhat contradictory to state that the earliest known Renaissance structure in France is a chapel. This slide shows the chapel of St. Lazarus built in the old cathedral of Marseilles (1479-81) by Francesco Laurana. It is, however, an isolated phenomenon without immediate results in a province far removed from the centre of national life, and not even immediately ruled by the French king. It was designed in the Italian manner by an Italian for a prince connected by blood with an Italian dynasty. Duke René held the semi-independent fief of Provence, together with those of Anjou and Maine. In or close to his dominions alone are monuments of similar character to be found so early, and they are the work to a large extent of the same artist. They include tombs at Le Mans and Tarascon, and a reredos at Avignon. I do not illustrate them, as it is impossible in the limits of this paper to touch on sepulchral design, or except very cursorily on church accessories. This group of works anticipates by from ten to twenty years the date usually assigned as the commencement of the Renaissance in French architecture; 1495 was the year in which Charles the Eighth invaded Italy and thus inaugurated a series of French campaigns in the peninsula, which extended over three reigns, and were one of the principal means of introducing the Italian influence into France. Not till after this date and the subsequent foundation by Charles of a colony of Italian artists at Amboise does the true career of Renaissance architecture begin. The next eight slides will show the designers attempting to amalgamate native and foreign motives by juxtaposition and intermingling rather than to reconcile them. In many cases at this period Italian influence was represented by an Italian carver who was employed to carve the more important ornaments and occasionally to design an entire feature, while his French colleagues either worked in their own style or made clumsy imitations of the new fashion. In addition to such efforts to introduce Italian detail, the means first and most frequently employed with a view to effect a change in the direction of classicism was the substitution of the curved for the pointed form, whether in tracery, in the heads of openings, in arches, or in plan.

In this screen from St. Jacques at Dieppe the tracery, the bases and sections of the mouldings, and the spiral shaft are all in accordance with flamboyant Gothic usage, but the shell panel-heads, the capitals, the entablatures, and the round arch speak of the Renaissance.

Similarly in this door from the cathedral of Aix, in Provence, there is a complete mingling of pilasters and arabesques with crocketed pinnacles. It looks as if the work was done by a Frenchman much more at ease in the contorted naturalism of the contemporary Gothic foliage than in the calmer conventional flowers and fruit of the friezes and panels of the Italian type.

In this pier from the front of St. Michel, at Dijon, the Gothic element in the detail has been reduced, but the niches are still composed of alternately Gothic and Renaissance elements, but the Renaissance elements are more thoroughly assimilated.

This lantern crowns the northern of the two towers at the west end of Tours Cathedral. The upper part of the tower is one of the earliest transitional ecclesiastical structures whose date is known. It was finished in 1507, probably by the brothers Martin and Bastian François. The southern tower finished forty years later, probably by Martin's son Gatien, is virtually a copy of it. The two elements are better blended in this example than in most of the previous ones, but still without definite system.

In this font canopy at Bretagnolles, near Evreux, all the detail except the shaft bases is Renaissance, but the shafts themselves and their caps have a fifteenth century outline. The tendency to turn the cusping of the tracery into foliage is one which was much developed later.

This wooden rood-screen is from Villemaur, a village near Troyes: it seems to have reached exactly the same stage of development as the last example, though not finished till 1521. It belongs to a neighbourhood which was for many years an important centre of Renaissance church work. The churches of Troyes itself are rich in examples.

When we turn from single features to a complete composition we find that the task of amalgamation proved rather more than the architects of the day could cope with. Nothing more awkward can be imagined than the front of the church of St. Calais, near Chateaudun, as a whole. Almost all the features are translated into Renaissance forms; some of them are individually beautiful, as for instance the central doorway with the scrollwork tracery in the fanlight. But in composing the entire elevation the architect floundered hopelessly. He got a certain amount of horizontality into it, but felt bound to keep the traditional vertical division by using clumsy buttresses, and then made a futile attempt to connect them up with the upper window by a flamboyant Gothic label with a pediment on the top of it.

Very different is the front of the castle chapel at Ussé, where the designer has succeeded in fusing the two styles into a harmonious blend. While almost every detail is Renaissance the general effect of the elevation is distinctly mediæval, so completely does it retain the vertical aspiring character, an effect emphasised by the grouping of the door and window into a single feature under a pointed arch and a canopy of Flamboyant outline. The pinnacles have no crockets or gablets, but are represented by a feature of approximately similar silhouette—a tapering candelabrum motive.

Having now reached the stage when the language of Lombard Renaissance detail has been thoroughly assimilated, we may take an example which gives the fullest expression of its application to a church. St. Eustache, in Paris, begun in 1532, is the largest and completest Renaissance church of the century in France. It was designed as a whole from the first as a Renaissance building, and, with the exception of the west end, carried out in accordance with the original design. The architect is not certainly known. The ultra-patriotic writer, M. Léon Palustre, invented a beautiful theory that it was the work of three generations of a family of master masons named Lemercier, and therefore owed nothing to Italian influence. But this theory will not bear investigation. There is nothing to show that either the first or third had any connection with St. Eustache or that they were related, or that the second ever even existed. On the other hand, there is nothing improbable in the suggestion that the design was due at least in a measure to Dominic, of Cortona, known in France as Boccador, who, after living for many years at Blois, where he worked for Louis XII. and Francis I., and was the probable inspirer of much of the work in the Loire valley, removed, at Francis I.'s order, to Paris in 1531, to act as architect to the new Hôtel de Ville. The work was carried on slowly till 1589, and resumed from 1624 to 1654, when it was complete with the exception of the upper part of the west front.

It will be a convenient method of taking a survey of the development of religious architecture if we take St. Eustache as our standard for each aspect of church design, and make excursions to other examples to illustrate each, always returning to it as our headquarters. By completing its lacunæ from other buildings we may obtain an idea of the splendid results which might have been achieved had external circumstances permitted an unfettered development of the school.

In plan St. Eustache is practically identical with Notre Dame, the principal difference being that whereas Notre Dame has five bays in the choir and eight in the nave, St. Eustache has three and five respectively. In other respects the dimensions are nearly equal. The internal width of the transepts is about 148 feet, and the internal length about 280 feet (not counting the Lady chapel). The circular form of the apse is not in this case a Renaissance innovation, but borrowed from the Gothic model.

In section the likeness is less striking. Though the height of the nave (107 feet) is about equal, it is flanked by double aisles, both of great and equal height, instead of the low inner and lower outer aisles at Notre Dame. In consequence the air of spaciousness is greatly increased, and, a much loftier nave arcade being possible, the effect of verticality is also greater though counter-balanced by round instead of pointed arches and vaults, as may be judged from this view of the interior.

We may begin the analysis of the building with the design of the piers. The slide shows a pier between the outer and inner aisles. It is of the compound type with pseudo-orders performing the various functions required. On the angles are members composed of a series of superposed pilasters and engaged shafts taking the relatively thin and unimportant diagonal ribs, their entablatures, which correspond with the springing of the chapel vaults and arches, &c., introducing a welcome horizontal element. On the faces of the piers, on the other hand, are unbroken panelled pilasters carrying the heavier cross vaulting ribs and arches of the arcades. They supply the strongly-marked vertical line, yet further emphasised at the crossing piers, which is the dominant note of the interior.

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* A paper read at the last meeting of the Architectural Association by Mr. W. H. Ward.

The nave pier from Ennery, near Pontoise, shows a similar system applied to a small country church.

At St. Pierre, at Tonnerre, compound piers with no horizontal element introduced are used at the section with similar responds for the choir arcade, but the remaining choir piers make a return to the single shaft, and are treated as Doric columns, with the cylinder carried above the cap for the arch moulds to die into. The treatment of the latter as a panelled splay is effective, and seems intermediate between the receding mouldings of Gothic tradition and the architraved treatment of the later Renaissance.

St. Etienne du Mont, in Paris, is contemporary with St. Eustache and of similar plan, but it is on a smaller scale, and shows a gradual growth in style from east to west. The choir (1517-37) is almost pure flamboyant Gothic; some Renaissance elements appear in the crossing and transepts, and they become more pronounced in the nave (1538-60). The west end and rood-loft belong to the reign of Henry IV. The balustraded gallery halfway up the piers is a pretty and almost unique feature, whose use is to steady and give an appearance of solidity to the tall plain shafts. It is curious that the tower arches should be of more advanced type of design than the upper. The capitals are unnecessary and unsightly.

Though adorned with clumsy sculpture, this nave-pier from Notre Dame de Bon Secours, at Guingamp, is an interesting one. The heavily-moulded arches die into a cylindrical shaft, which lower down becomes octagonal and stands on a square base. A slender circular vaulting-shaft is carried up the face from the floor.

This slide shows the arches and vaulting carried by the pier in the last. The arches are pointed, but have a keyblock. The triforium is prettily designed, but carried out in the clumsy detail usual in Brittany, and due partly to the distance from more civilised centres and partly to the hardness of the local stone.

This view from the nave of St. Taurin, at Evreux, shows another triforium and one of the most successful treatments of the springing of the vaulting ribs, which are carried by a compound corbel.

I am unfortunately not able to illustrate very fully the interesting subject of the treatment of vaults. The sixteenth century inherited the tendency of the fifteenth to great elaboration either by further complication of the rib system or by the enrichment of the parts. In both cases the sole object was decorative. It goes without saying that the ribs received classical sections usually of the architrave type. Ribs, bosses, and web are each decorated. In this vault, occurring in a cloister running along the side of the castle-chapel at Champigny sur Veude, the boss takes the form of garlanded patera. In this vault from the church of Valmont, it is replaced by a miniature dome, and the webs are carved. Pendants are frequently introduced, especially in star vaults, such as are usual at crossings—for instance, at St. Etienne du Mont. But they are also placed at other intersections of ribs, are richly decorated, hang down to a considerable depth, and are connected up with the roof by flying ribs and volutes, thus giving an air of great elaboration to a vaulting system which is sometimes in itself a simple one.

The multiplication of ribs left such small intervals that it was found they could be filled with a single stone, a discovery which gave rise in Normandy to a series of rib and slab ceilings, of which that at Tillières is one of the less elaborate examples. Those in the chevet of St. Pierre, at Caen, are far more intricate. They consist of a skeleton rib system with no cells, but with spandrils filled with a carved slab as here, or with tracery. This supports another, almost horizontal, rib system with its spaces filled in the same way with enriched slabs.

A number of other devices besides true rib vaults were also used. That in the cloister of St. Martin, Tours, is a segment of a spherical dome with concentric ribs and cells, and crossing at right angles, the former in stone, the latter in brick.

Barrel vaults with false ribs, or coffered, also occur as in the chapel of St. Saturnin at Fontainebleau, and a few small domes, as in the Pendentif at Valence and the Bishop's chapel at Toul.

Outside Brittany, where they were traditional, I only know of one timber roof of the Renaissance in the castle-chapel at Fleurigny. It takes the form of a boarded barrel.

### *Chevets.*

We may now turn to the exterior, beginning at the east end. The chevet of St. Eustache, differing only in detail from that of a Gothic cathedral, requires no detailed description.

The château-chapel at Champigny sur Veude shows another type of translation of Gothic work, each feature being rendered differently from those at St. Eustache. There is no chevet, but a sacristy on either side reached by the cloister.

The church of St. Julien du Sault has chevet chapels built in Gothic times, but by the time the clerestory was reached the Renaissance was in full swing.

Contrariwise, at St. Pierre, at Caen, chevet chapels of Francis I. work are built round an apse which is almost entirely Gothic. The decoration, as frequently in Normandy, is of a more exuberant type and with bolder projections than would be the case round Paris or in the Loire valley. The Lady chapel is carried up an additional storey.

### *South Elevations.*

Though surpassed in the beauty of special features and detail by other examples, St. Eustache gives as fine an example of the side elevation of a Renaissance church as can be found.

The south side of St. Pierre, at Tonnerre, is probably a little later than the last example. The aisle windows contain contemporary glass dated 1541. There is a restraint and refinement about both the design as a whole and its detail, which is in marked contrast to some examples—St. Pierre, of Caen, for instance.

At St. Pierre, at Dreux, the south transept added to a large Gothic church has a façade of good Henry II. work, which in spite of minor awkwardnesses, is of as majestic and monumental a character as could well be expected from a Classic front applied to a largely Gothic plan and section. Unlike any we have yet seen, this façade is composed as a whole on Classic lines. It terminates in a well-designed gable with small central pediment above the cornice shown on the slide

It was probably carried out by one of the Métezeau family who were master masons at Dreux for several generations before being employed at the Louvre, but the design may well owe something to Philibert de l'Orme and Jean Goujon working at the time (about 1540) at the neighbouring château of Anet.

### *West Fronts.*

I cannot show the west front of St. Eustache as it wa originally designed, for it was never finished and no longer exists. What there was of it was removed in the eighteenth century to make room for a façade designed by Jean Mansar de Jouy, a grandson of Jules Hardouin Mansart, the architect of the Invalides, begun in 1754, and afterwards altered by Moreau Desproux, architect of the façade of the Palai Royal, but still lacking the south tower when the work stopped in 1787.

The front of St. Michel, at Dijon, has the same genera arrangement of a nave front flanked by twin towers. But a St. Eustache the vertical lines of the towers were carried to the ground by bold pilastered buttresses. There was a grea central door as at Dijon, but windows at the sides, and th storeys in the towers were more varied.

At St. Michel the great three-arched portal is borrowed from a mediæval cathedral, and the horizontal line above i hardly more strongly marked than at Notre Dame at Par where the junction with the upper part of the towers is muc more skilful. These towers, with their monotonous repetition of similar storeys, are in Henry II. detail, and were no finished till the seventeenth century. They are obviously b an inferior hand to that which designed the bold Transitiona lower storey, with its charming lantern lighting the centra archway.

The three-arched portal motive was repeated in at leas two other churches at Vouziers in Northern Champagne where it appears in fully developed Francis I. work, and a Villeneuve sur Yonne, in Burgundy, in Henry II. detail. Th architect who had fairly mastered the superficial aspects o the style had, however, no conception of the principles o design which accompany it, and only uses the detail as it wer as a veneer, though not without attaining a certain majest due to the great lines of the composition and the comparativel quiet character of the ornament.

The west front of Notre Dame, at Tonnerre, added to Gothic church is perhaps on the whole nearer to the old fron of St. Eustache than either of these three, though it has onl one tower whose stair-turret is visible in the foreground Owing to the narrowness of the street and the bad weatherin of the stone of which it is built the great beauty and delicac of the work can hardly be appreciated from a photograph

The splendid church at Gisors has a complicated histor There was a nucleus of thirteenth century work, largely adde to in the fifteenth, and constantly patched between 1497 an 1579. In the middle of this latter period the fifteenth centur high vaults fell in, causing much other damage, which had be repaired. The present building is, therefore, a museum of styles, and shows specimens of excellent quality of many different periods. The north tower, is Transitional below, with a rich Francis I. lantern. The new front was flamboyant Gothic, and between its buttresses a central portal of exquisitely refined and sober Francis I. work was inserted. Then two and a half storeys of the south tower and the connecting portion were added in Henry II.'s reign, and the loggia over the west door in that of Henry III. Though the general design of the south tower is not specially remarkable, no example of this period in the whole of France surpasses it in beauty and refinement of detail and ornament. A decorative sculptor of a very high order must have been employed upon it, and it has even been suggested that Jean Goujon had a hand in the work.

The church at Pont Ste Marie, near Troyes, shows a three-gable front, with the picturesque overhanging verges common in the district. The nave portal is late Gothic. The north aisle portal is in late Francis I. detail. The designer, however, felt bound to retain the pointed form for the window. In the south aisle he went the whole hog and made it round-headed.

We now come to an example of a towerless front with only one gable. The castle chapel of Champigny sur Veude, whose apse and cloister we have already seen, appears to have been built from the east westwards, so that the narthex porch, a feature of which several examples are found at the time, is of early Henry II. work, and a very refined example. It looks as if a pair of towers may have been intended.

The last two examples of west fronts I shall show you both belong to a period later than 1550. The first one, that of St. Pierre at Auxerre, though probably the later of the two to judge from its florid character, retains much more of the Gothic type of design and a greater admixture of Gothic features than many earlier ones. It is one of the very few church fronts in France with three orders below the gable.

The façade of the church at Le Mesnil-Aubry is far quieter, and designed as a whole on classical lines, and is the nearest approach to the typical seventeenth century church front. It is possible, indeed, that the gable is a seventeenth century addition. It has been suggested that the church may have been designed by Jean Bullant, who worked for many years at the neighbouring château of Ecouen.

### *Towers.*

St. Eustache having no sixteenth century towers, we must take our examples elsewhere. Of the four which I have chosen three show different stages of development, and one a peculiar provincial type.

The noble tower of Bressuire has the bold buttresses with many offsets of the mediæval French towers, and consequently the same tapering silhouette, though in detail, at any rate, in the upper storeys all is Renaissance.

The tower of St. André, at Loches, on the other hand, recalls an Italian campanile with its vertical shaft, only broken by long pilaster strips and shallow panelling.

The unfinished tower of St. Nicolas, at Rethel, is a sturdy example of Henry II. work, with a sober use of the orders in the form of buttress-like pilasters at the angles. The upper storey may be a little later, perhaps about 1600.

The steeple at La Roche-Maurice is typical of the Breton manner. Its date is uncertain. The detail, as in most Breton work for a century after 1550, is a sort of bastard Henry II. type. Brittany was the land of spires, and the spire died there hard, surviving long after it was extinct elsewhere. The strongly marked horizontal features were already prevalent in pre-Renaissance examples.

The next two slides are not exactly of towers, but of tower-like structures. The first is of the well-known Francis I. clock turret which stand beside Chartres Cathedral. The second is the Haute Vieille Tour, Rouen.

This monument, built in 1542, in the old market at Rouen, is known as the Fierte de St. Romain. On the saint's festival his relics were carried in procession through the lower arch and exhibited in the loggia above, and it was the custom to lead a prisoner by the same route and release him.

(*To be concluded.*)

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

On Thursday evening, February 10, before a meeting of the Society, Mr. Raymond Unwin, well known by reason of his connection with such schemes as the Letchworth, Hampstead, and Earswick Garden Suburbs, delivered a lecture on "The Planning of Suburbs." Mr. Unwin illustrated his paper, of which a *résumé* is given below, by an extensive series of views and plans of the Hampstead Garden Suburb and typical examples of town planning abroad.

The successful setting out of such a work as a new city will only be accomplished by the frank acceptance of the natural conditions of the site, and, humbly bowing to these, by the fearless following out of some definite and orderly design based on them. To straighten a river, level a hill, fill up a valley, or even cut down a fine clump of ancient trees, to make the site fit some preconceived design would be presumptous folly. Such natural features should be taken as the keynote of the composition; but beyond this there must be no meandering in a false imitation of so-called natural lines. Let our avenues be straight or boldly curved, not aimlessly crooked, and let our open spaces be not shapeless patches, but squares, circles, or other orderly forms. The glittering path of the river as it winds across the plain, or the slope of the mountain range standing out in silhouette against the sky, delight us indeed; but the inconceivably complex conditions which form these curves have no part in any work of ours, and in attempting to mimic them we but miss that beauty of orderly design for the creation of which alone power has been given to us.

The problem is complicated because it is necessary to consider not only what is desirable, but what is possible, with the building conditions prevalent now. In the Garden City at Letchworth a considerable degree of harmony has been secured by requiring all roofs to be covered with tiles, while the very cheapness of the land at Letchworth and the desire of many of the early settlers for the most countrified sites has led to an appearance somewhat too scattered for the best architectural effect. This, however, will gradually rectify itself, and if in some cases too great freedom has been left, this in its turn will help to foster local public opinion.

In Germany there has been a great change in the style of their town planning. When the modern town-planning movement started the formal and geometrical style typical of Haussmann's work in Paris was adopted, and the work was much in the hands of engineers; but since the time of Camillo Sitte a more irregular and picturesque style of work has become prevalent and is being carried to an extent which tends to destroy dignity and architectural effect.

Taking the Hampstead Garden Suburb by way of illustration, one can see the importance of carefully studying the site, preparing a survey of the trees and other features on the land, together with a contour plan, before attempting to lay it out. The convenience of access to certain points, such as the railway station, drainage facilities, proper gradients for the roads, &c., will indicate generally the lines which the more important ones will take; while the cutting up of the land into the building plots of suitable sizes, with due regard for economy in length of road and proper consideration for the aspects of the buildings, will determine in a general way the lines of many of the building roads. The preservation of the outlook across any open space available should be considered. It is also essential to secure a suitable position to form the centre of the parish, suburb, or estate, where may be grouped the more important buildings.

Having in a general way determined all these factors, the problem becomes essentially very much one of the exact lines and arrangement of the roads, together with the building lines, and the placing of the buildings must be determined primarily on architectural grounds to secure satisfactory street pictures, whether of a picturesque or more dignified and architectonic character. In dealing with areas devoted to cottages economy in roads is the first consideration. At Hampstead, by means of a special Act of Parliament, power was obtained to make roads limited to 500 feet in length of a width of 20 feet, provided the houses on each side were not less than 20 feet apart. As justifying the granting of this privilege the Trust bind themselves not to build more than an average of eight houses to the acre over the whole estate.

The passing of the Town Planning Act affords an opportunity, probably for the first time, for controlling the character of suburban development, and it will be the duty of architects in future to regard their buildings as parts of a total picture rather than as isolated units. At the same time an immense opportunity will be afforded for considering streets and areas as a whole and for producing architectural grouping on a large scale. If wise use is made of the powers given in the Act, and if the citizens, and especially the architects and surveyors, will co-operate, it may be possible to stop the devastation going on round all our large towns, and begin to build up suburbs worthy to be the homes of the people.

At the close a cordial vote of thanks was accorded the lecturer, and a discussion, led by the President, Mr. Percy Robinson, F.R.I.B.A., followed, in which Messrs. Musto, A.R.I.B.A., G. J. Coombes, A.R.C.A., and Councillor Bowman participated.

At the next meeting of the Society, to be held on Thursday, February 24, Mr. J. B. Fulton, A.R.I.B.A., will read a paper on "The Church of Santa Sophia."

## ACTION AGAINST AN ARCHITECT.

MR. POLLOCK, one of the High Court Official Referees, on Feb. 3 heard the action of Gibb *v.* Schintz. The plaintiff, Mr. John George Gibb, an architect, of Newmarket, Cambridge, claimed fees and remuneration alleged to be due to him for work carried out for the defendant, Miss Dora Schintz, of Chuldwall Hall, Liverpool, on her estate at Thickthorne, near Kenilworth, in Warwickshire.

Mr. H. W. Cox, describing himself as Official Receiver for Cambridge and Peterborough, and trustee of the estate of the plaintiff, said that as he had no funds in the estate he was obliged to conduct the proceedings himself. He, however, was not in a position that day to proceed with the plaintiff's claim for various reasons, including Mr. Gibb's absence in the country.

After some discussion, it was agreed that Miss Schintz's counter-claim for damages against Mr. Gibb for alleged breach of duty should be proceeded with.

Mr. F. A. Greer, on behalf of Miss Schintz, pointed out that the main question was the same on claim and counter-claim: had Mr. Gibb really carried out his duty under his engagement, and, if he had not, how much damages he was liable to pay? Mr. Gibb had been employed, said counsel, to overlook drawings and specifications in connection with improvements at Thickthorne, and to supervise the work carried on by the contractors there. Counsel added that Miss Schintz's case was that plaintiff had carried out his duties so badly and negligently and had allowed bad and wrong work to be passed that she had been put to considerable expense and loss. Miss Schintz alleged, amongst other things, that Mr. Gibb had allowed the building contractors to depart from the original drawings, and also to reduce the height of the house stables by 2 feet throughout in the contract drawings. It was also said that the archways were all made too low, with the result that considerable structural alterations, causing much delay, had to be made.

Witnesses on behalf of Miss Schintz included Mr. Henry Hartley, of Liverpool, an architect, who described in detail the several defects of which the lady complained. He pointed out in the course of his evidence that there had been an improper substitution of zinc for lead for flashing gutters, tops and cheeks to dormers. He added that the mortar used had no combining qualities, stating that those portions exposed to the atmosphere would greatly deteriorate, and so leave open joints. He thought that constituted a serious detriment to the building, for if it were known that mortar of that kind were employed an architect would put a substantial discount on its value.

Mr. Hartley considered it was the duty of the architect to have apprised his client of the substantial alterations between the original and the contract drawings. It was usual to notify the employer of any changes that occurred as the work proceeded. Witness also considered it was the duty of an architect to examine or estimate the bills of quantities and prices carefully or correctly.

Other evidence having been given concerning plumbing and woodwork,

Mr. Pollock, addressing Mr. Cox, said that after the evidence he had heard he did not quite see how he could resist this counter-claim to any extent.

Mr. Cox: Unfortunately I have not been able to see the premises.

Mr. Pollock: I have seen the premises and seen quite enough to satisfy me that a great part of this work was executed most disgracefully. Mr. Gibb ought to have been there for the purpose of protecting Miss Schintz, and under these circumstances I do not see how it is possible for Mr. Gibb to prove the right to recover whatever money may be payable to him. It would seem from the evidence that he has acted in such a way as to cause considerable expense to Miss Schintz.

Mr. Cox said that he felt that some of the statements which had been put forward that day on behalf of Miss Schintz might by other evidence have very probably been reduced in a certain way, and that the case on the other side would not have been quite so bad. He, however, felt it was quite possible that he should be doing well in accepting the Official Referee's advice and coming to an agreement with his adversaries. He should like to ask what interest Miss Schintz had in this building? Had she paid any money for these improvements?

The Official Referee: That will not affect her right to decline to pay, but only the question of damages.

Mr. Cox: I am not prepared to go on with the claim for remuneration.

Mr. Greer explained that Miss Schintz was the legal owner of the property and was also the assignee of her brother's rights therein. She had expended her own money in doing the work which had not been done at the outset.

Subsequently, after a consultation, Mr. Greer said:—I think we have agreed. There will be judgment on the claim for the defendant with costs to be added to her claim against the estate, but not costs personally, and judgment also for her on the counter-claim for 500*l.*, and costs proved for in bankruptcy.

## NATIVE CRAFTSMANSHIP IN TIMBER, BRICK AND STONE BEFORE THE EIGHTEENTH CENTURY.*

IT is always inspiring to be reminded of the wealth of native craftsmanship in our own country. Those who are fortunate enough to be able to travel in foreign lands in search of the beautiful, find wondrous buildings and masterpieces of art and decoration which, while the impression is still fresh, perhaps incline one to look upon the work of our own forefathers as often falling short of the marvellous achievements, not only as regards design, but also as regards execution, of those artists of other and sunnier lands. But it is a great mistake to be too easily carried away by the glamour of foreign travel, and the people who are most likely to fall into it are those who have never had the opportunity or have never taken the trouble, to find out what an astonishing amount of beautiful work in many materials there is in our own country. It will be my endeavour to show you this evening how the English craftsmen handled the three building materials with which they were most conversant—timber brick and stone—at a time when the glorious traditions of English craftsmanship were still being handed on, unfettered by the overpowering presence of any particular individual who, by producing a set design, subjected all the workers engaged in its execution to the materialisation of his ideas For that is what has happened ever since the art of building has been led to depend more and more upon the professiona architect. With the Renaissance came this rise of the individual designer, but before that far-reaching movement swept over the land, the building arts were safe in the keeping of the craftsmen and their guilds, and the men who conceived the completed form of the structure as likely as not worked with their own hands in its actual execution. At any rate there is little doubt that such was the case in the building of houses, and it is to house work that I am confining myself this evening. Not that one wishes to attempt to distinguish between church building and house building from the point of view of craftsmanship, for there were no distinctions whatever: the methods of spanning an opening in the church were just the same as those followed in the house the windows were the same—allowing for greater elaboration as was natural in the church—and the details throughou differed in no essentials, whether it were the shaping of a plinth course or the profiling of a coping. But there is no doubt that in the Middle Ages the highest excellence wa achieved in ecclesiastical buildings, and that it was in th fabric and decoration of the church that the craftsmen found their greatest opportunities. When we think of the danger to which the house was subject all through the Middle Ages dangers of attack and pillage by armed foes, it is no wonde that provision for means of defence played so important a part in the disposition of dwellings and tended towards a greater solidity and less display of decorative detail than wa quite admissible in the church fabric, with its comparativ immunity from attack. But the men who were engaged in building the church very often, no doubt, reared the mano house near by, and traditional methods which had been handed down from father to son through generation afte generation, were as applicable in the one case as in the other But it was not until the wonderful enthusiasm for church building which had characterised the Middle Ages had to a certain extent abated, that the whole-hearted attention o ftsmen was directed towards the erection of houses that be considered as dwellings as distinct from strongholds. nsequent upon the further check given to church building the suppression of religious houses under Henry VIII., the confiscation of church revenues, a burst of building ivity found expression in countless houses, great and all, all over the land, which gave opportunity for carrying crafts too well established and too full of vitality to suffer serious rebuff. It has been argued in the not remote st, that the arts of England were becoming effete at the e that this summary check was given to church building the early part of the sixteenth century, that decadence had in, and that nothing short of a wholesale importation of forms and ideas could stop its downward trend; but re is good reason to believe that had not something like a character been given to the building arts as a result of spreading of the Renaissance movement to our shores, sh spirit and renewed energy would have been acquired m internal sources, and that the native craftsmen would ve even exceeded the high pitch of excellence to which they d attained by the time that this influx of foreign ideas and eign craftsmen deterred them from working further on their n lines.

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* A lecture delivered at Carpenters' Hall on February 9 b Mr. Arthur Stratton, A.R.I.B.A.

However that may be, it seems to me that it is very difficult to detect lack of initiative or lack of skill in execution in domestic work of the English builders, and without keep- to any strict chronological order, I will show some amples which will be more convincing than any theories of own. All through the period when native craftsmanship seen at its best, builders invariably used local materials, d very rarely were materials native to one district carried to another, where they would have very likely looked out place and inharmonious with their surroundings. To this eptance of local materials we owe the great variety in sign and colour of buildings in different parts of England, d to this much of their interest and charm is attributable. hen good building stone could be quarried in abundance, for instance, in the south-west of England, in Derbyshire d Yorkshire, it is rare to come across a homestead which es not present quiet stone-walling, mullioned windows, ne gables, and stone-covered roofs. In the Eastern Coun- s, where little stone was to be had, but a plentiful supply clay, we find beautiful brick houses, with every member rried out in that material, or with the more finished parts ecuted in wrought stone. In Norfolk, Suffolk, and parts Wiltshire flint was turned to good account, while in the ickly wooded counties of Kent, Surrey, Shropshire, Cheshire d parts of Lancashire, from the excellent timber an entirely ferent system of construction resulted in the picturesque lf-timber houses with bright tiled roofs, which are one of e special glories of England. Nowhere can the unlimited sources of house builders be seen to greater advantage than the homesteads built by the native craftsmen in our own ntry; progress never halted, and the same types and difications of types seem to have been arrived at all over e country by workers who were impelled by the one dominat- g desire to build beautifully and well. There can have been direct communication between workers scattered over such wide area, yet allowing for differences of material and local fluences, they seem to have arrived almost simultaneously the same forms and to have expressed themselves in the me language.

Brick was long held in little repute as a building material this country; it does not seem to have been generally re- rded as worthy of careful and delicate handling much fore the period when the extraordinary impetus was given house building of which I have spoken. From that time ilders in the south and east of England relied upon it for any of their largest and most splendid undertakings to ch an extent that the mention of a Tudor house to many inds at once suggests a brick one. Nevertheless, the limita- ns of that material for all purposes, from straightforward lling to decorative details, had to be realised before really od work could be carried out in it, and except in districts ere stone was very scarce indeed, we rarely find brick used clusively.

One of the very best houses built mainly of brick, but with ne dressings to doorways, windows, copings, and other ought members, is Compton Wynyates manor house, and ng in a district where all three materials were available, we d them used side by side, their colours blending in the st delightful manner.

> "Many scarlet bricks there were
> In its walls, and old grey stone"

William Morris wrote of the old castle in "Golden ings." The walling is red brick, not of the dimensions are accustomed to nowadays, but longer and thinner rising five courses to the foot, with wide mortar joints, which are so valuable in giving the texture that one always finds in the walling carried out by these old builders.

The bricks in these houses vary in size considerably, ranging from 12 by 6 by 3 to 9 by 4½ by 1½, which is perhaps the most satisfactory dimension of all.

Whereas a large unbroken surface of stone walling is not without a dignity of its own, a large surface in brick would, as likely as not, prove to be somewhat monotonous, unless interest were imparted to it by bringing forward some parts and recessing others from the general wall face in order to get relief, and with it a play of light and shade. When building exclusively in brick, we find that the use of such a small material very often governed the design to the extent of breaking up surfaces, so as to obtain an effect of lightness; but when, as was often the case, it was not desired to sacrifice the breadth of wall surface it was made more interesting by the very simple expedient of building in patterns in a different coloured brick from that used for the general mass of the walling. This can be seen in the walling of Compton Wynyates. In burning bricks in a clamp, it is impossible that all should come out the same colour, because some are subjected to far greater heat than others, and this, according to the temperature, turns an ordinary red brick into a hard vitrified one of a deep blue or even black hue. These darker-coloured bricks were no doubt at first looked upon as defective, and rejected from prominent positions, until it was realised that by arranging them judiciously in the walling they served to give an added interest; and so growing directly out of the exigencies of the material itself arose one of the most artless and legitimate methods of structural colour decoration that the craftsmen of this country have ever indulged in.

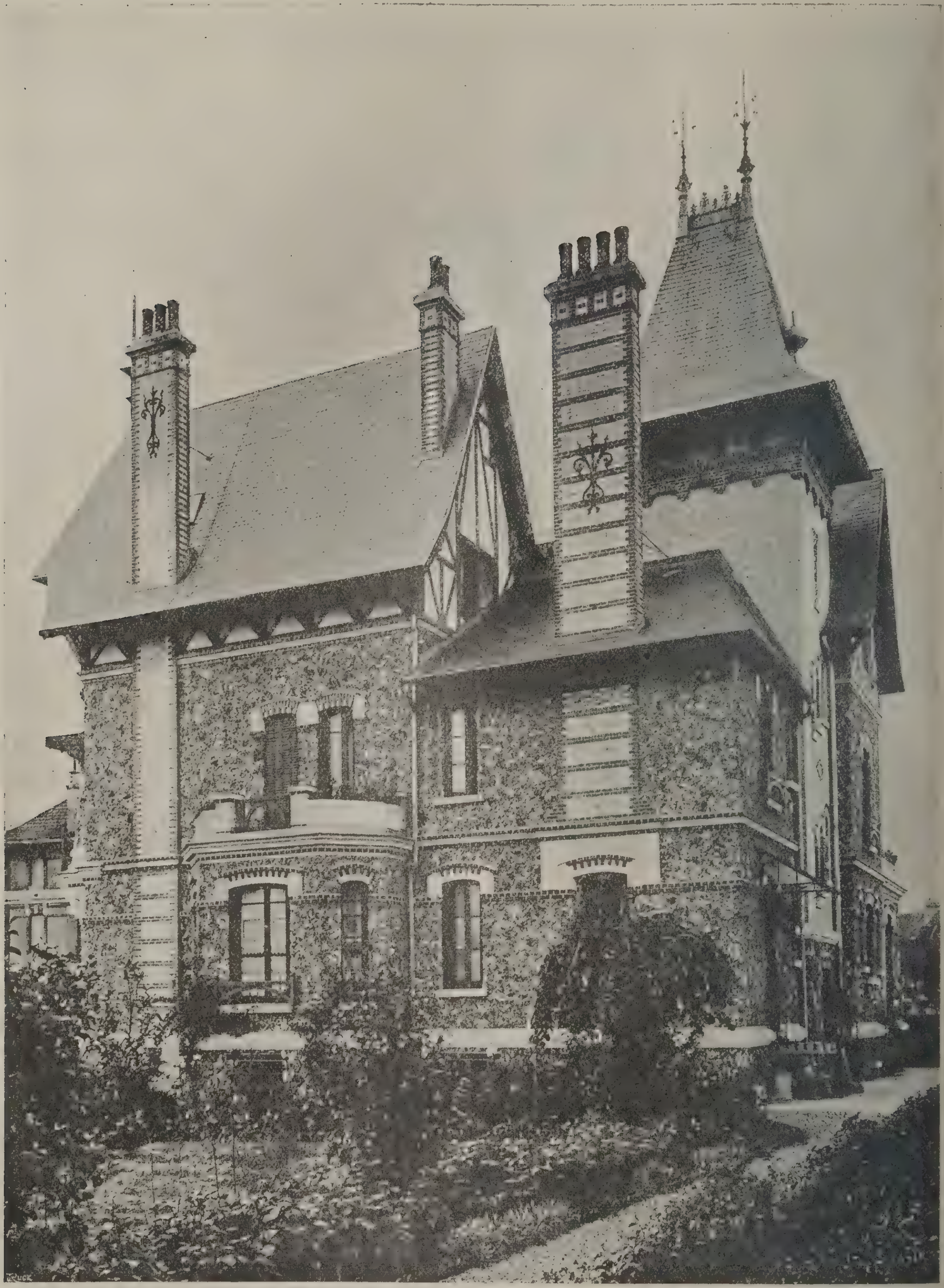
The variety of the patterns evolved is great, but all the earliest and most effective are very simple, consisting for the most part of diagonal lines crossing one another so as to form a diaper ranging anywhere from about ten to thirty courses in height. These are all formed of headers built in, if possible, without upsetting the English bond, which was mainly used, but it was often necessary to interrupt it somewhat. Care was always taken not to overdo this use of patterned walling, and on no account was the same pattern carried uninterruptedly over the whole surface, but the dark lines were allowed to melt away, and the pattern disappears and is picked up again in the middle of a diamond in what appears to be the most unstudied manner, yet it was a nice feeling for texture which prompted the bricklayer to build in another line of dark headers or to leave them out; and he seldom did it wrong. In such a house as Eastbury, near Barking, where rows of mullioned windows cut up the walling on every side, only in a few places are patterns found at all, and when they are introduced they are complete ones in themselves, not calling for repetition. Used with great reserve in this manner, these patterns are most effective and tell all the more by reason of the plain walling all round. The brick chimney-stacks of timber houses afford other good instances, one of the stacks at Moreton Old Hall showing a very good arrangement of three large diamonds in a height of about 14 feet, enclosing three smaller ones, but examples may be multiplied to any extent.

Another and more constructive method of relieving large surfaces and marking horizontal divisions is to be seen in the delicate brick trefoil-headed corbel courses which are introduced with such admirable effect on many gateway towers. These were no doubt in the first place suggested by the overhanging parapets of castellated buildings. They required no little skill to build, but there was no attempt to vie with the elaboration of masonry; on the contrary, although they give an effect of great richness by their constant repetition, they are in reality very simple and differ but slightly in detail in the three counties where they are most prevalent, Norfolk, Suffolk, and Essex.

A difficulty which has beset brick builders in other countries than our own as to how to finish projecting arcading and corbel courses at external angles was obviated in most of these gateways by recessing the face from which the corbel springs the exact amount of the projection of the corbelling, so that a flush face is obtained above it. At Oxburgh, Layer Marney, Little Leighs, Hadleigh and Giffard's Hall, and West Stow Hall, this brings about a panelled treatment to the faces of the octagonal turrets which further enhances the effect of verticality of the design, which is so valuable in a gateway. At Little Leighs the sides of the octagon measure 4 feet 7 inches, the panels are 3 feet 5 inches wide, and are recessed 4 inches.

On the front of the gatehouse at Rye House, on the Hertfordshire border of Essex, is an unusually elaborate example. Additional depth is given by first throwing a pointed brick

## MODERN EUROPEAN ARCHITECTURE.
### FRANCE.



[From *La Construction Moderne.*

COUNTRY HOUSE, "LES QUATRE VENTS," BEAUMONT-SUR-OISE.—M. Ch. Langlois, Architect.

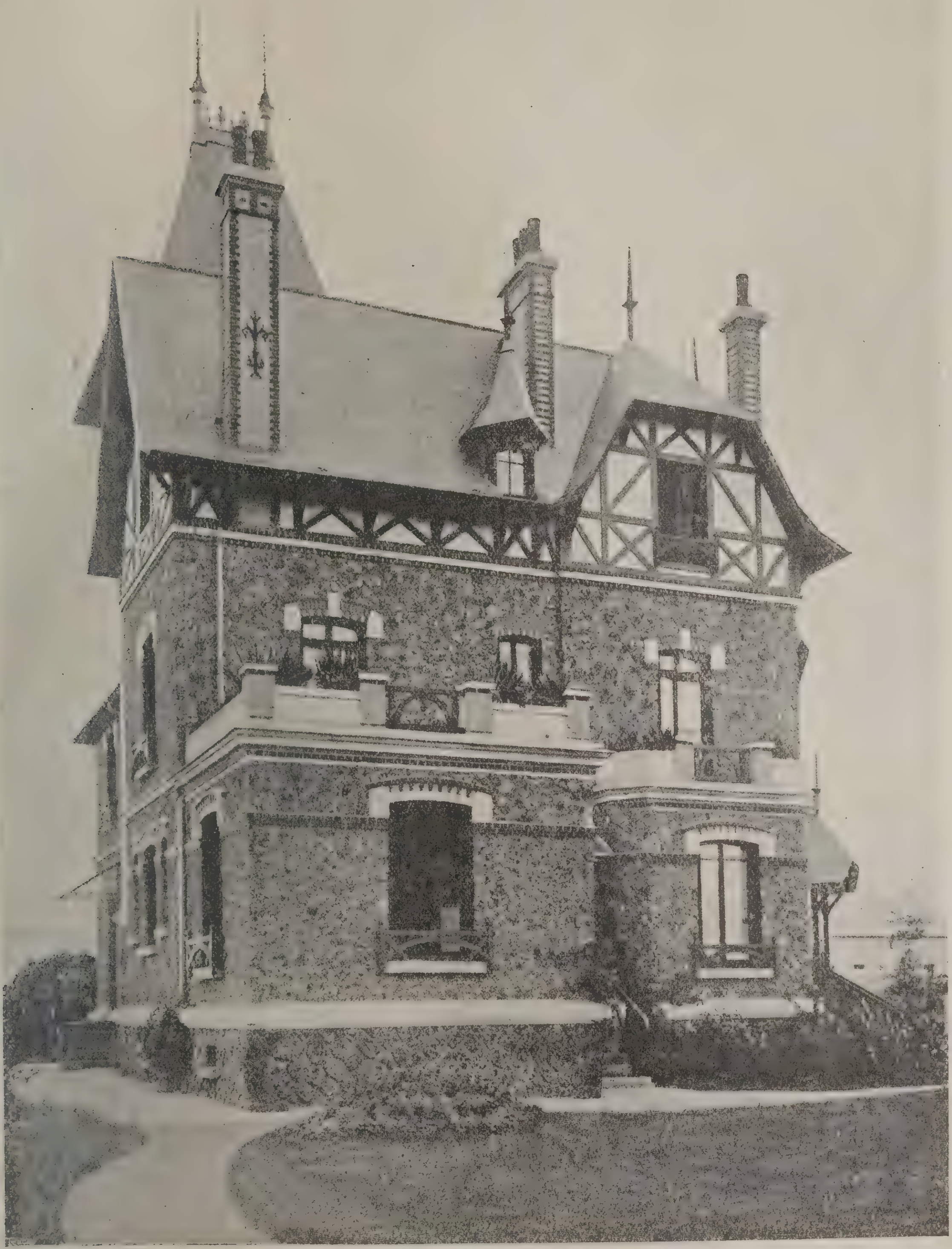
arch from corbel to corbel, and in front of this the cusping which consequently looks richer with such depth of shadow behind it.

At Nether Hall, a few miles away from Rye House, this corbelling is used without the recessing, and much more sparingly in consequence. This is another excellent instance of fine craftsmanship in brick, now sadly ruined through the abandonment of the house in 1773. The gatehouse would have been pulled down with the rest of the noble brick structure, but it was found to be so solidly built that it was left standing, albeit mutilated, and even now it commands our admiration. The brickwork is of a very mellow red tint, and the whole structure was built of it, including even the sunk handrails to the newel stairs, which are similar to other b ck handrails found at Tattershall Castle, Lincs., and East ry House, Essex.

In nothing is the skill of the brick builders seen to gre er advantage than in the chimney stacks which rise above he parapets of these gatehouses, and above the roofs of hou s, large and small. The variety of design is only equalled by he skill in manipulating cut brick—no two seem to be quite ke and all are satisfying. They are always of lavish dimensi ns, and are often elaborately enriched with spiral, zig-zag or reticulated patterns, executed in cut brick. The sha is generally circular or octagonal, rising from a well-mou ed base, and finishing with a capital, which in the best exam les

## MODERN EUROPEAN ARCHITECTURE.

### FRANCE.



[From *La Construction Moderne.*

COUNTRY HOUSE, "LES QUATRE VENTS," BEAUMONT-SUR-OISE.—M. Ch. Langlois, Architect.

as the octagonal sides slightly hollowed, so that they may eet in a sharp point, the angles being further emphasised y small projecting pieces which fret the sky and give a crispess to the profile, which is very effective.

Yet another use for brick was in the filling or nogging etween the uprights of half-timber work. When these spaces ere not plastered, in the way we have already seen at Eastngton and the lower storey of Grimshaw, the fancy of the uilder seems to have suggested all manner of ways of laying he long thin bricks in these narrow spaces for no other reason han to give interest and to please the eye. The craftsmen f those days never lost an opportunity to obtain good wall exture.

At Great Chalfield is, as far as I know, an unique instance of stone-filling between the oak uprights. This has recently been brought to light by Mr. Harold Breakspear, to whom an extensive rebuilding of the house has been entrusted. Being a stone district, this ingenious system has been suggested by the material most easily obtainable, but the filling has proved more lasting than the framing, being held in position by means of stone keys. The necessity for the use of the materials of a particular district was the foundation of the elementary principles of the building crafts of this country, and rarely does one find an exception to the practice of using the local materials and of making the handiwork subservient to the proper application of those materials.

At Stockton manor-house, Wilts, flint being easily obtainable, it was used in conjunction with stone, the courses alternating with bands formed of two rows of unsquared flint, set out with but little regularity, and not carried round the porch. At Thornbury Castle, Glos., a magnificent stone-built house, curiously enough brick was introduced for the principal chimney-stacks, although it is eminently a stone district, and many of the forms of spiral enrichment were equally applicable to stone. It is no uncommon thing to find red brick stacks to stone houses, especially in Kent and Shropshire, sometimes because the stone was not suitable for use in thin slabs placed on end. It must be allowed, nevertheless, that the houses nearly always gain by the contrast of the rich red beside the grey stone walling. It may have been the desire for colour contrast that prompted the introduction of these small spots of brick in such a house as Thornbury; but it is more likely that we have here an instance of the building owner, who in this case was no less a person than the powerful, but ill-fated, Duke of Buckingham, who was executed in 1521, over-ruling local tradition in his desire to vie with such brick stacks as he had seen in his journeyings to and fro the capital. Such lapses from local custom are rare and generally to be attributed to some such special cause. The use of foreign materials is even more rare; only once have I detected foreign stone in a house of this period. At Brede Place, Sussex, Caen stone was clearly imported for the mullioned windows of the withdrawing room in a house otherwise built entirely of local materials. In the church near by this stone was used about the same time, and there is reason to believe that French masons were also in evidence there.

Stone as the larger material has always suggested greater breadth of treatment, and a simple reliance upon the dignity and repose of plain wall space. Relief may be produced in very simple ways, and one of the most effective found in districts where stones of more than one colour were available was the arrangement of light and dark courses, not necessarily alternating, but often more pleasing if built in haphazard at the whim of the mason. In such a house as the Abbot's dwelling at Muchelney, Somerset, we find the mellow Ham Hill stone, which is still quarried not many miles away, used for the greater part of the structure, with quoins of lighter Pibsbury stone introduced with charming effect. In Northamptonshire, instances of this structural colour relief to plain walling are met with; but, generally speaking, contrast is more often obtained by the disposition of masses and the careful proportioning of solids and voids.

(*To be concluded.*)

## LIVERPOOL UNIVERSITY.

Mr. W. H. Lever has given to the School of Architecture in the University of Liverpool three prizes of 20*l.*, 10*l.*, and 5*l.* annually for the best scheme for laying out the land near the church in the centre of Port Sunlight, to provide sites for a village library, picture gallery, a gymnasium, and a college for higher education. Mr. W. H. Lever further offers, if he carries out any of the schemes submitted, to pay the author of it 100*l.* These prizes are open to students both in the School of Architecture proper and the Department of Civic Design. The former include in their schemes designs for various buildings, the latter contenting themselves with the general plan.

Mr. Ronald Jones, architect, an old student of the School of Architecture, has given to the school a travelling scholarship for this year of 50*l.* to be held at the British School at Rome. To this the British School has added a further 25*l.* With these sums it is hoped that a student will be able to work at the British School for at least six months, and do a piece of restoration work under the Director of the School similar to that done at the French School, but, of course, of smaller scope.

## OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* contains illustrations of a number of new school buildings in various parts of the United States, in none of which is our central hall adopted, and some have no assembly-room or auditorium. There is a further paper by Mr. Wm. H. Goodyear on "The Controversial Aspects of the Architectural Exhibition at the Brooklyn Museum."

*La Construction Moderne* illustrates a design for a synagogue at Tunis by M. Tardu, and details of the façades of the Hôtel Chatham, Rue Volney, Paris, of which M. Decaux is the architect. Our contemporary discusses the situation created by the unwillingness of the Italians to allow the French Government to purchase the Farnese Palace for us as an ambassadorial residence.

The *Architectural Record*, continuing its series of arti es on the architecture of American colleges, now deals v h Princeton University. Other papers are "Building a chu h for a small congregation," by Herbert Wheaton Congd ; "The Architect's Proper Sphere," by Professor W. R. Ware; "Architectural Aberrations," a discourse on c n-position, by John Beverley Robinson; and "Utilita n Architecture at Chicago," by Peter B. Wight.

*Construction* is chiefly occupied with the work of r. F. S. Baker, F.R.I.B.A., of Toronto, executed since 1 2, which comprises a large variety of utilitarian as well as a s-tic work.

The *Engineering Record* has an interesting illustra d article on a new type of reinforced-concrete construction n which the usual girders and beams were eliminated, in -duced by Messrs. Condron & Sinks, of Chicago, used by t m in the Studebaker building of seven storeys above gro d level and described recently in a paper before the West n Society of Engineers.

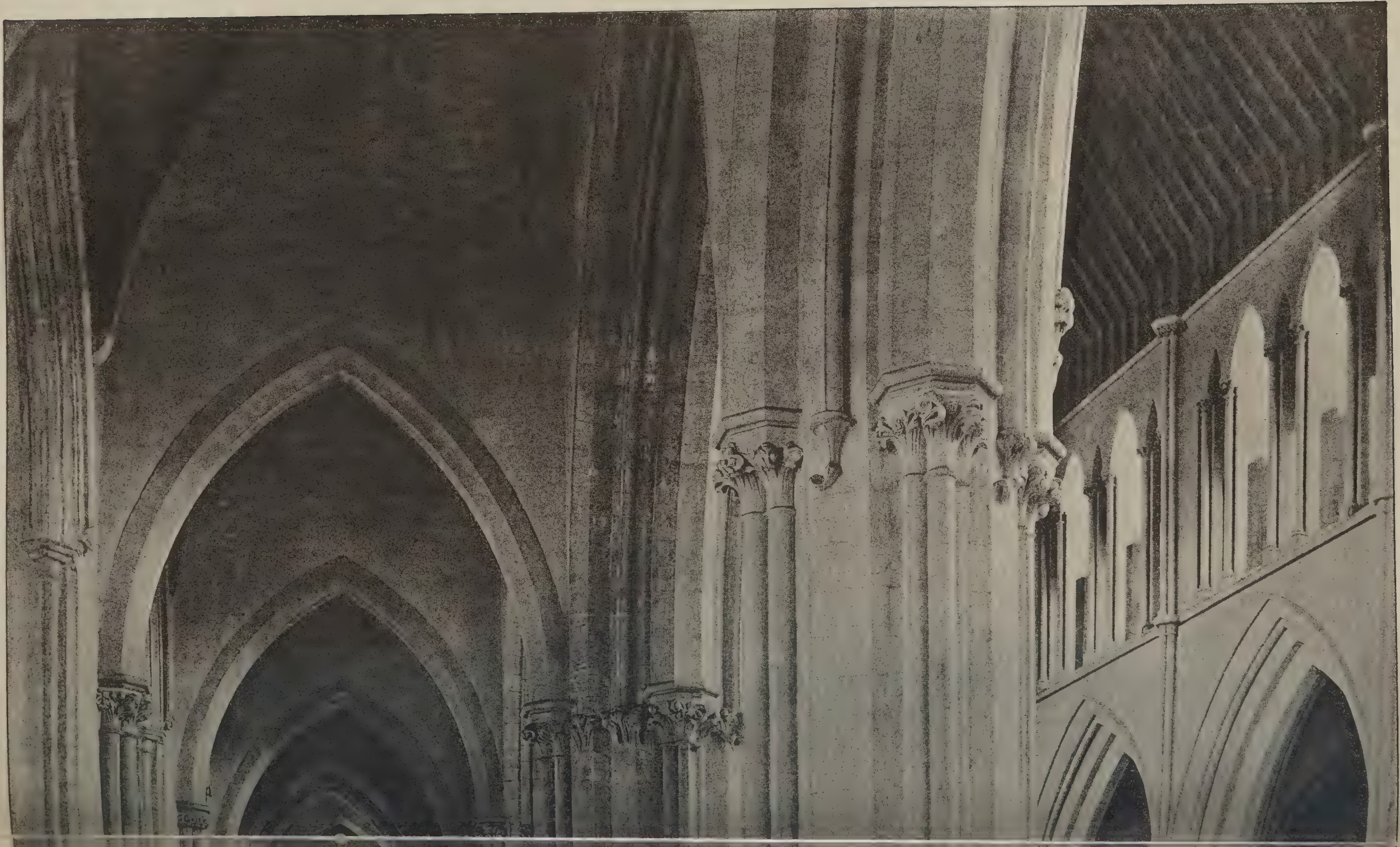
## COMPETITIONS.

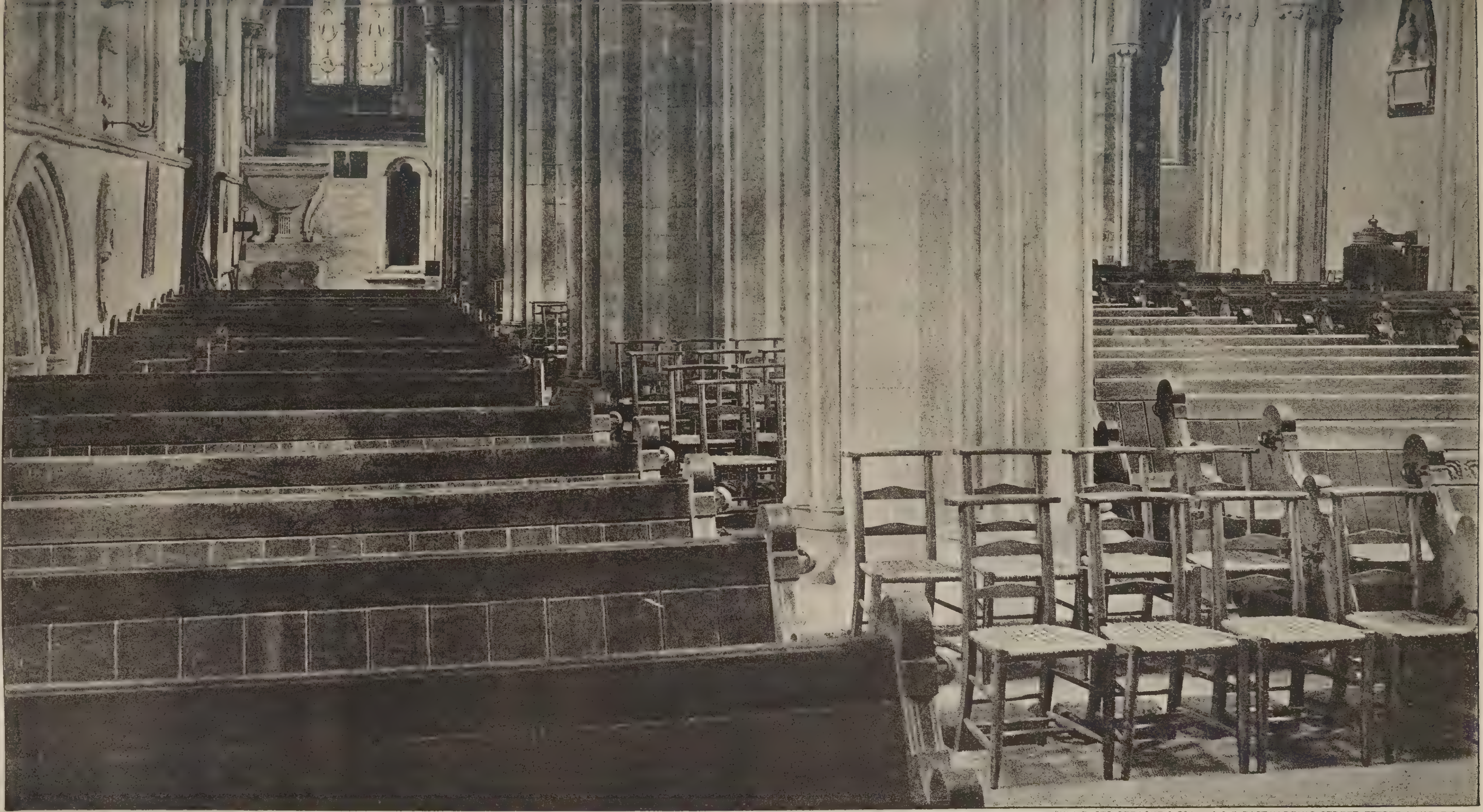
Our contemporary *South Africa* says:—The work of l-judicating upon the designs sent in for the Johan s-burg Town Hall, which is to cost 120,000*l.*, was complete n mail week, and the selection has given general satisfact n. Mr. Leonard Stokes, Vice-President of the Royal Institut f British Architects, who has acted as assessor, made the l-lowing awards:—First premium (500*l.*), Messrs. Hawk & McKinlay, Cape Town; second premium (300*l.*), Mr. W. L. Stucke, Johannesburg; third premium (150*l.*), Mr. Dou s Hoets, Pretoria; fourth premium (100*l.*), Mr. P. Tre y, Johannesburg; fifth premium (100*l.*), Mr. F. G. McInt a, Pretoria. The prize plans are remarkable for ha y utilitarian and ornamental qualities. Compactness of p n has been aimed at, a compactness which permits of no w te of space, and which, at the same time, allows of dignified d imposing elevation. The frontage is topped by a square to r, and is beautified by Ionic columns in relief. The plan of e building is a rectangular oblong, conforming to the shap f the site, and leaving about 100 feet at either end to be d out in gardens as proposed. The municipal offices occupy t portion of the site facing the G.P.O., with its main eleva n fronting the building. The public hall has been place t the rear of the municipal block, with its long axis diagon y across the site. Care has been taken to isolate it comple y from the municipal offices, at the same time so placing e supper-room or small lecture hall as to allow of its being d either in connection with the public hall or the munic al offices. This disposition will admit of the municipal b k and the large public hall being erected at different perio if thought fit. The public hall main entrance is from Presi nt Street, away from the traffic of the tram lines. In the arra e-ment of the municipal offices the main consideration has n compactness and directness of planning, with easy acc i-bility to the various departments from the street, an o er specified in the general conditions. All departments re grouped together on the same floor as far as possible. e position of the Council Chamber and committee rooms ll preclude all possibility of disturbances by street noises at the same time they are readily accessible to the several dep t-ments. The three large courts or areas in the centre of e building will admit of ample light to and the ventilatio of all parts. In the course of an interview Mr. Stokes sai — "On the whole, the competition has, I think, well answ d its purpose. The municipality has certainly done its bes to make it a success. I must add that I had no difficult in coming to a decision for first place, yet the designs as a w le have attained a high level of excellence. South Africa as evidently no lack of competent architects to choose from or important undertakings."

Dundee University College Council have approved p ns for a laboratory of mechanical, hydraulic and civil engi r-ing, estimated to cost 11,000*l.* The plans were prepare y Messrs. Rowand Anderson & Paul, architects, Edinbu h, who were instructed to take estimates for the work.

The election of six members of Council of the Conc te Institute has resulted in the return of three new members d the re-election of three of the old members. The new mem rs are Professor Henry Adams, M.Inst.C.E., M.I.Mech ., M.S.A., &c., Mr. E. Fiander Etchells, and Mr. Willian . Kirkaldy, A.M.Inst.C.E.

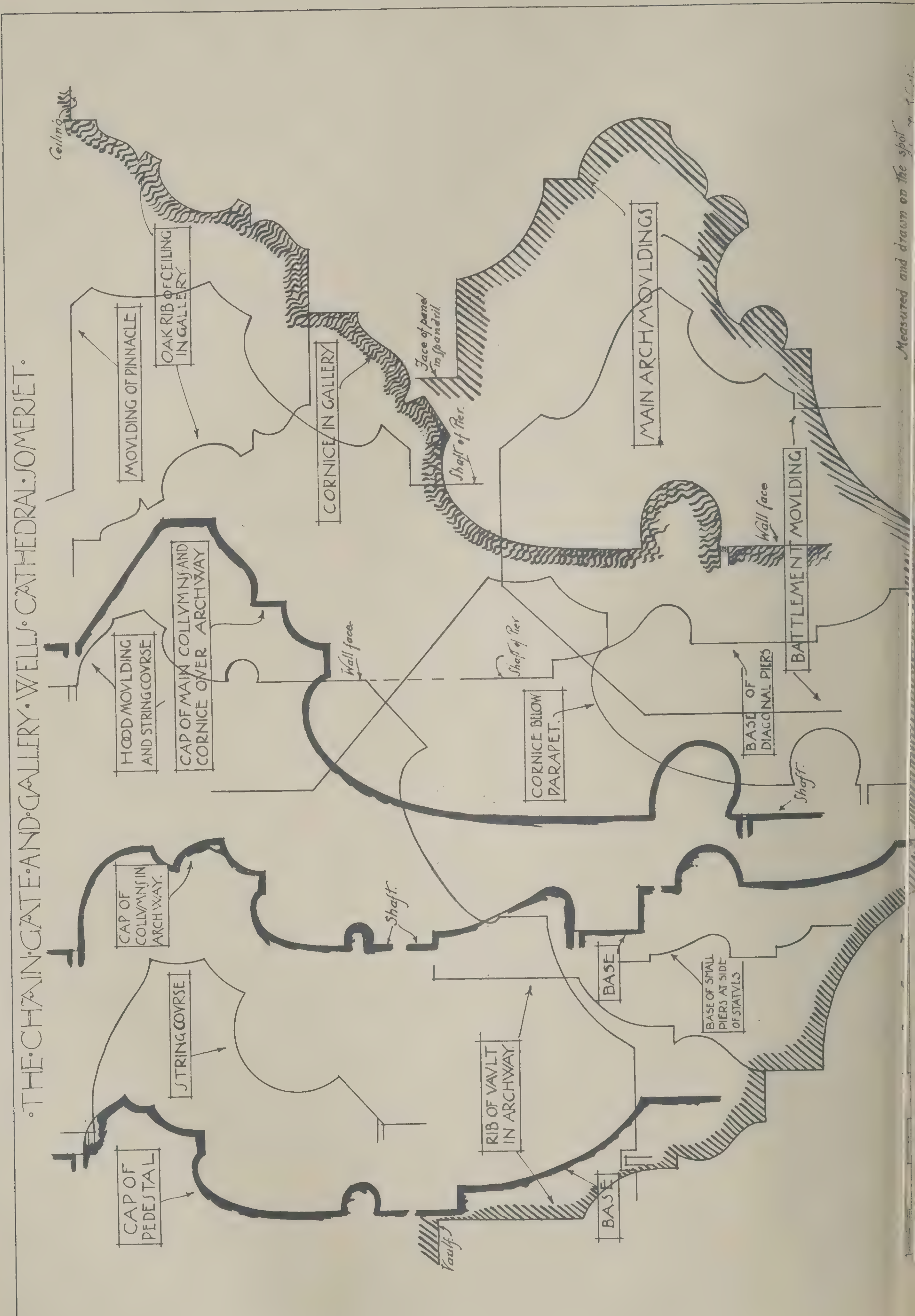
OF THE
UNIVERSITY of ILLINOIS





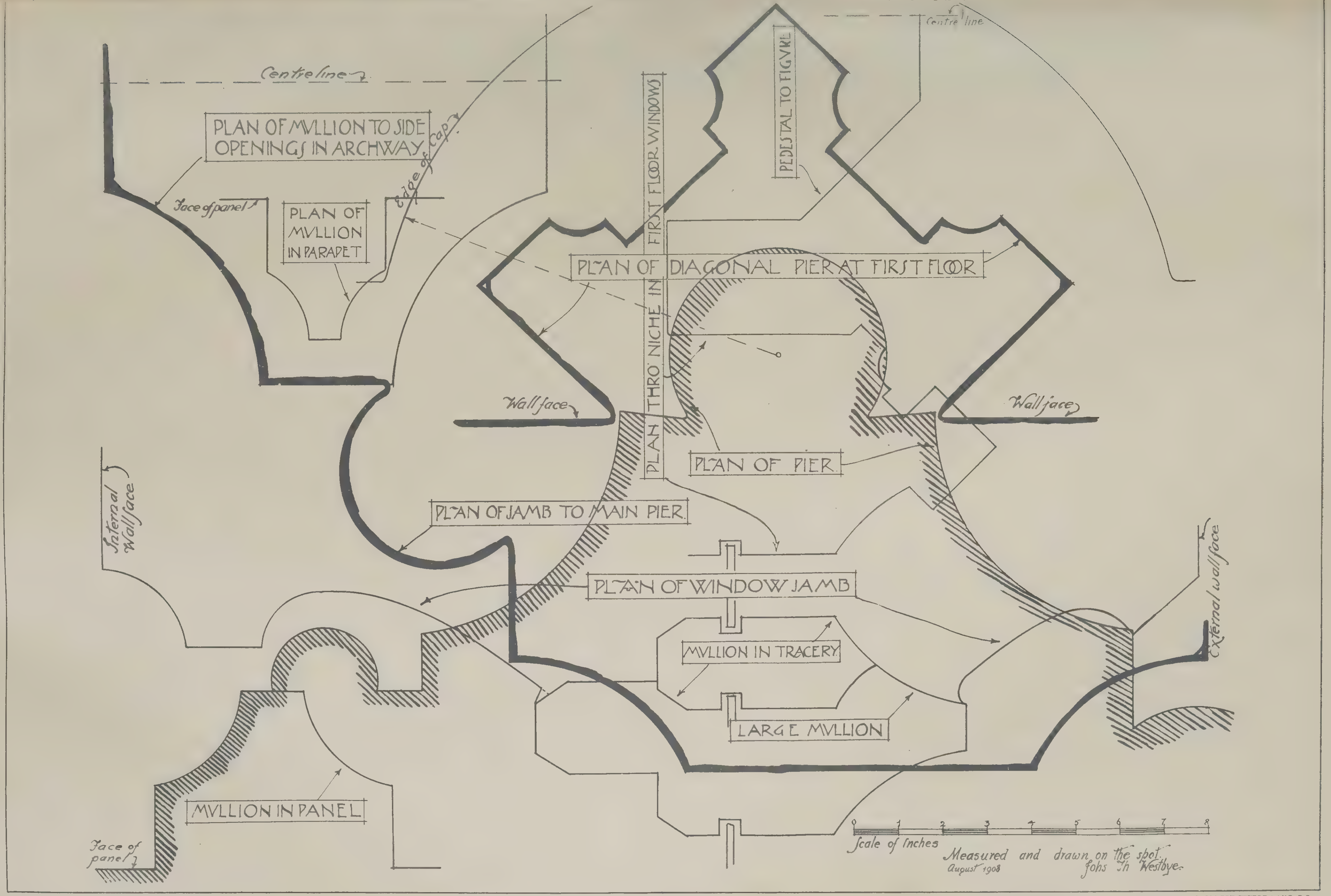
"INK-PHOTO. SPRAGUE & C^o L.' 4 & 5 EAST HARDING STREET. FETTER LANE. E.C.

CATHEDRAL SERIES, NO. 661.—LLANDAFF: SOUTH NAVE AISLE, FROM EAST.



·THE·CHAIN·GATE·AND·GALLERY·WELLS·CATHEDRAL·SOMERSET·

THE CHAIN GATE AND GALLERY, WELLS CATHEDRAL, SOMERSET.



Measured and drawn on the spot.
August 1908 Johs Th Westbye.

PHOTO. THE SPRAGUE & Co L., 4 & 5, EAST HARDING STREET, FETTER LANE, E.C

# The Architect.

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## FORTHCOMING EVENTS.

*Monday, February* 28.

Royal Institute of British Architects : Business meeting to discuss "Regulations for Architectural Competitions."

*Wednesday, March* 2.

Northern Architectural Association : Paper by Mr. J. Oswald, F.R.I.B.A.

Edinburgh Architectural Association : Paper on "Heraldry as Applied to Architecture," by Mr. J. Horne Stevenson, advocate.

Carpenters' Company : Lecture on "Castles in the Air," by C. F. A. Voysey.

Royal Archæological Institute : General Meeting.

*Friday, March* 4.

Architectural Association : Paper on "The Mediæval House," by Mr. J. Alfred Gotch, F.R.I.B.A.

Leicester and Leicestershire Society of Architects : Paper on "Wood-carving," by Mr. J. Armitage.

*Monday, March* 7.

Royal Society of Arts : Cantor Lecture on "Lead Work," by Mr. Lawrence Weaver, F.S.A.

## ARCHITECTURAL ASSOCIATION SKETCH BOOK, 1909.

THE latest volume of the Architectural Association Sketch Book strikes one as possessing a peculiar value as a work of reference, being notable for the very large proportion that it contains of careful measured drawings of buildings or parts of buildings of high architectural value, and in some cases of wide repute.

There is less of the fragmentary fashion of collecting all sorts of architectural bric-à-brac and more of the system of incorporating valuable and useful records of interesting, if not of important, buildings. The series of careful measured drawings of Ely House, Dover Street, London, by Mr. W. J. Jones, filling nine plates, is an example of this system. Another is the R.I.B.A. prize winning set of drawings by Mr. Ernest W. Wray, of the church of the Madonna di San Biagio, Montepulciano, a characteristic work of Antonio da San Gallo, the elder. Although one would not, perhaps, place either of these buildings quite in the front rank they are nevertheless interesting and well worthy of the permanent record that inclusion in the "A. A. Sketch Book" provides.

Of mediæval buildings, for the editors of the "A. A. Sketch Book" are wisely and properly catholic in their selection of examples, we have a capital series of drawings of the charming and well-known Stokesay Castle, Shropshire, by Mr. D. Robertson, and the magnificent and equally well-known parish church of SS. Peter and Paul, Lavenham, Suffolk, which, if not completely delineated, is sufficiently so, by Mr. Alan G. Brace, to form a valuable record of this remarkable East Anglian church.

In pursuance of the policy of publishing some of the remarkable sets of measured drawings that are continually prepared and exhibited in the annual competitions for the prizes of the Royal Institute of British Architects, the editors of the present volume have included the examples of Robert Adam's work in the Royal Infirmary and David Dale's house, Glasgow, measured and drawn by Mr. E. Douglas Smith.

Valuable amongst the records are Mr. J. L. Berry's drawings of the central or "Bell Harry" tower of Canterbury Cathedral; the beautiful and much drawn sedilia of the church of All Saints, Hawton, Nottinghamshire, measured and drawn on the spot by Mr. Sydney H. Miller, Pugin student; the elevation and section of a bay of the presbytery of Ely Cathedral, also by Mr. Miller; the Loggia dei Lanzi, Florence, measured and drawn by Mr. G. Drysdale; the part of the sacristy in the church of San Lorenzo, Florence, forming the setting for the tomb of Lorenzo dei Medici, for which we have to thank Mr. Alick Horsnell; the west façade of San Petro in Toscanella, one of the most interesting churches of the Late Italian Romanesque period, drawn by Mr. Lionel U. Grace; the lower order of the front elevation of the Grimani Palace, Venice, by Mr. G. Drysdale.

Although in a sense all the drawings in the "Sketch Book" are records, and therefore useful for reference to those who desire to have before them the measurement and delineation of some particular building, some are less to be regarded as occupying this position than as suggestions in design or pleasurable presentments of the picturesque or the beautiful in architecture.

Of both of these classes the present volume gives several instances, although, as we have already premised, record and reference are the main categories to which one would naturally ascribe a major portion of the plates issued.

The main staircase from the Palazzo Balbi at Genoa, drawn by Mr. Alick Horsnell, is useful for its suggestiveness as one of the remarkable series of interiors for which Genoa is famous. Apparently the plate now given is but an instalment, as it is lettered "Sheet I.," and the remaining sheets are to appear subsequently. Another example from Genoa is a doorway from the Via Santa Caterina, a curious piece of Late Italian Renaissance design sketched by Mr. C. Gascoyne. The Palazzo Torugi at Montepulciano, of which two elevations, part plan and details of mouldings are given by Mr. Alick Horsnell, is a good example of one of the less important works of Giacomo Barozzi da Vignola. Mr. Horsnell also gives measured drawings of a loggia in the garden of a more famous work of Vignola's, the Villa di Papa Giulio. A perspective sketch of the staircase and pavilion between the upper and lower courts of the same residence is contributed by Mr. C. Gascoyne, so that altogether Vignola is fairly well represented in the present volume of the "A. A. Sketch Book." Two other examples of Renaissance architecture in Rome also afford useful suggestions, the church of Santa Maria in Campitelli, drawn by Mr. Leslie Wilkinson, and the east front of the church of Santa Maria Maggiore, by Mr. G. Drysdale. An excellent study of one of Palladio's designs is Mr. Leslie Wilkinson's scale elevation of the Loggia del Capitanio, Vicenza.

It is remarkable that the seventy-three plates in the "Sketch Book," not including the frontispiece, are contributed by nineteen draughtsmen only. This is partly accounted for by the several instances of a long series of illustrations of one building each, which go far to establish the character of the present volume as a book of reference and record. Then of the thirty-three plates of Italian work, the great majority have been contributed by four men, G. Drysdale, C. Gascoyne, Alick Horsnell, and Leslie Wilkinson.

The high standard of excellence to which the "A. A. Sketch Book" has attained and which it maintains is no doubt partly attributable to the policy of including the work of a few very able and industrious draughtsmen, but on the other hand this policy does not tend to the encouragement of a numerous band of devotees to sketching and measuring. So that what the "A. A." gains in the value of its "Sketch Book" as an admirable production it loses in the character of an incentive to study. We are by no means disposed to say that the present policy is wrong, but possibly some of the lack of support which has been deplored in annual reports and presidential addresses is due to the fact that as it now exists the "Sketch Book" appeals rather to the purchaser than to the contributor. For the purchaser it is an admirable and wonderfully cheap guinea's worth, and no architect who can afford it should fail to be a subscriber.

It is a curious coincidence that the number of illustrations of English architecture is exactly the same as that of Italian work, thirty-three; thus England and Italy fill sixty-six out of the seventy-three plates in the volume, leaving only seven for the rest of the world, of which three are occupied by Mr. E. Douglas Smith's drawings of Robert Adam's work in Glasgow to which we have already alluded.

From Belgium the solitary example is one of Mr. C. Wontner Smith's masterly drawings, the western tower of the church of St. Martin at Ypres. French architecture is represented solely by two of Mr. A. E. Martin's drawings from Rouen, both details, the one of the internal staircase of the Hôtel de Ville, the other, a doorway and screen in the church of St. Vincent. Spain furnishes but one illustration, a clever drawing by Mr. Leslie Wilkinson of an interior view from the north transept of the cathedral church of Santa Maria, Burgos.

Of English architecture there are not many examples in addition to the drawings we have already mentioned, and of these Mr. E. Garratt contributes four plates, one containing measured drawings of the south porch of the priory church of St. John Baptist, Burford; another of the south porch of the church of SS. Peter and Paul, Northleach, Gloucester; a third, the beautiful and refined fifteenth-century brass lectern in the church of St. Martin, Salisbury; and the fourth a clever perspective of the fan-vaulted nave of the abbey church of St. Mary the Virgin, Sherborne.

Other English examples are The Grange, Broadway, Worcestershire; an eagle lectern from the church of St. Mary the Virgin, Cropredy; and a brass candelabrum from the church of St. Helen, Abingdon, all measured and drawn by Mr. Sydney H. Miller; an interior view with detail sketches of the church of St. Gwinear, Cornwall, by Mr. C. de Gruchy.

The title-page bears a striking sketch of part of the Château de Blois from an unusual point of view drawn by Mr. C. E. Mallows.

## ST. MARGARET, CLEY-NEXT-THE-SEA.

THE south porch here illustrated is part of the church of St. Margaret, Cley-next-the-Sea, Norfolk. The chancel, transepts and nave walls of the church were commenced in the Decorated style, while the remainder, including the south porch, was completed in the Perpendicular style. The spandrels in this porch bear the arms of Richard II., impaling those of Anne of Bohemia. In the jamb moulding are the Agnus Dei, arms of England, the cross keys, and the arms of three famous Norfolk families, the De la Poles, De Warrens and Erpinghams. The doorway in the porch has an ogee arch which encloses a trefoil, which in turn encloses a cinquefoil. The church is in an excellent state of preservation with the exception of the transepts and the north porch, which are in ruins. No dates are available.

## NOTES AND COMMENTS.

The assessors in the competition for the Welsh National Museum have selected for further consideration twelve of the 129 sets of designs sent in, and from these will make their final award, after the consideration of which by the City Council the plans will be exhibited at the old Town Hall, Cardiff, for a fortnight.

Hexham Abbey seems to be following the bad example of some other great churches and revealing its defects piecemeal. Perhaps, though, this may be part of the policy of those concerned with its preservation. But whether policy or carelessness it is equally reprehensible for those in charge of an ancient monument to reveal trouble bit by bit. The first thing that should be done when there is a suspicion that all is not well with a cathedral, abbey church, or other national monument of ancient architecture is to have made a careful and searching examination of the whole fabric and to let the friends of the building have a complete knowledge of everything that is wrong. But to shriek about the danger of a north transept and then when funds have been provided and expended for its preservation to "discover" that the south transept is in imminent danger, is playing the fool and insulting to the generosity of the faithful by the implication that they would not make a worthy response for a great need, but may be egged on to a series of contributions by a succession of frantic appeals.

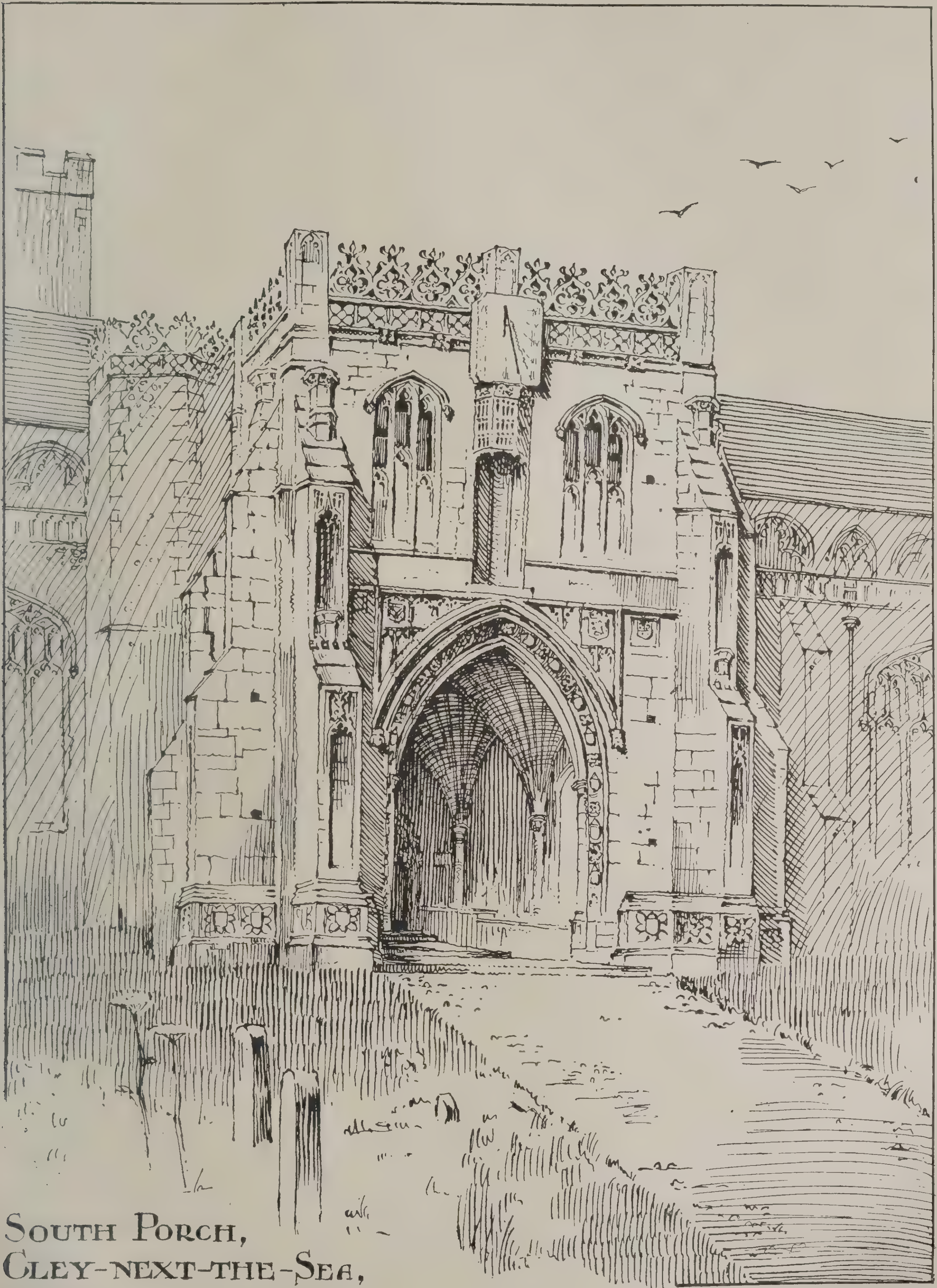
At the annual general meeting of the Scottish Modern Arts Association held last week at Edinburgh the Chairman, Mr. A. Stodart Walker, gave a clear exposition of the fallacy of super-taxing the rich for the benefit of the poor in its effect on art production and art workers. Mr. Walker said that "What the future held in store for the arts in this and other countries it was difficult to say, but without entering into any political or economic discussion he might be allowed to give it as his opinion that any serious interference with what he might call the super-means of society was bound to react in a marked fashion on the patronage of the arts. The modern book world and the picture world have already suffered to an extent with which few of them were familiar. He thought it could not be disputed that the more difficult it became for the citizen to hold a reserve for things outside his business of keeping himself alive within the limits of comfort, the more would those things which the sociologists might term State luxuries suffer. The arts and crafts of the world flourished chiefly in an age of rich patrons, and it was difficult to see in thei absence how these arts could flourish and yet allow the craftsmen to earn a legitimate wage."

The death of Mr. J. M. Swan, R.A., removes fro amongst us one of the great exponents of the possibilit of artistic achievement in both painting and sculpture and, at the same time, probably the greatest sculptor o animal life of British birth. There was in Mr. Swan' work none of that added human expression that wa imparted by Sir Edwin Landseer and Mr. Brito Riviere, but a frank and truthful portrayal of th animal.

At York the City Council are still hankering afte the destruction of the Castle walls, although the count justices have refused to accede to the Council's reques for their demolition. It seems that the Castle occupie a curiously anomalous position, as it is not included i the city of York nor in any one of the three Riding so that one alderman suggested that it might not be i England at all.

In a case at the Manchester County Court last wee the judge remarked upon the difference that will be mad in the common law relating to the liability of landlor to keep houses in a condition "reasonably fit for occup tion" by the provisions of the Housing, Town Plannin &c., Act. A contract to keep the house in all respec reasonably fit for human habitation is to be implied

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



South Porch,
Cley-next-the-Sea,
Norfolk.

Drawn by Adrian Hardman.

the part of the landlord for all houses let in the County of London at 40*l*. a year or less, in a borough or urban district with a population of fifty thousand or upwards at 26*l*. a year, and for a house situate elsewhere at 16*l*.

The Dean of Westminster, in proposing a vote of thanks to the Rev. W. Marshall, M.A., F.S.A., for his lecture on "English Mediæval Fonts and Monuments," at Carpenters' Hall last week (which is reported on another page), congratulated him on being able to show in the heart of the City of London views of such an exquisite series of monuments without having recourse to Westminster. In the Abbey there were to be found, he said, by anyone who cared to see them, specimens even more beautiful than any shown. Alluding to one of the slides, which showed a very Early Norman figure slightly in relief on a flat stone on the ground, the Dean said it recalled the earliest Abbey monument. This was of Abbot Gilbert Crispin, who came over with the Conqueror, and who was elected Abbot in 1117, on the recommendation of Lanfranc and Anselm. The slab of that marvellous black Tournai marble was lying in the cloister more or less exposed to the weather, and it had resisted the footsteps of thousands of the Westminster boys. It was practically a flat smooth surface, the eyes, nose, and mouth having entirely disappeared. But, fortunately, at some period, possibly 150 or 250 years ago, somebody must have caught his foot there and fallen heavily, for they had filled up the broken part with Roman cement. The fact was pointed out to him recently by a young Frenchman who had been studying the subject of the monuments of London. The cement was carefully picked out, and beneath they found the ears in perfect preservation. To prevent the possibility of a second accident the Dean had the small hollow filled up again.

Sir Oliver Lodge, in lecturing recently before the Birmingham University Engineering Society on "Protection from Lightning," criticised adversely the idea that most people still possess as to the best method of affording protection. The old idea of protection from lightning was that there was a charge of electricity in the clouds which had to be conducted to earth, and that the best plan was to give it an easy path, so that it would take the path they desired rather than follow a path of its own. It was thought the electricity followed the ordinary laws of electric conduction, and that, if they provided a good copper conductor, that conductor would be chosen in preference to all inferior conductors. The matter, however, was not quite so simple as that. There was a good deal more in it than merely getting the charge to earth. It was not only electricity but energy with which they had to deal; and the problem really consisted in dismissing that energy. It did not follow that to get rid of a certain amount of this energy quickly was to get rid of it as safely as possible. Given a store of energy in the clouds, they could get rid of it suddenly by providing it with a very perfect conductor, say a copper pillar an inch thick. But if they did this they must expect violence. It would be better if they could let it pass through thin iron and take time in the process. It was desirable to provide the buildings with lightning conductors, but it was not necessary that they should be made of thick copper. There were certain advantages in thin iron, inasmuch as thin iron would not carry the charge so quickly, and therefore less violence ensued.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### V.—THE REFRIGERATING MACHINE (*continued*).

*Condensers.*

In the condenser the direction of the heat exchange is exactly opposite to that in the evaporator or in the direct expansion piping. Instead of latent heat being absorbed into the medium for its evaporation (from the brine or air round the coils) it is dissipated as the medium condenses. A certain amount of heat is also given to the vapour as it is compressed, and this, together with the latent heat of condensation, is carried away in the cooling water. To perform this operation economically, with the minimum amount of water, is the function of an efficient condenser.

There are many different designs, which may be classified into three types, as follows:—

1. Submerged condensers.
2. Double-pipe condensers.
3. Atmospheric condensers.

*Submerged.*—This type of condenser has already been briefly described when dealing with the machine as a whole. It consists of either one or several coils, which are immersed in water contained in a suitable tank. When a number of coils is necessary, the upper terminals are united by a common header, which is connected to the delivery side of the compressor. The lower terminals, where the liquid is taken off, are joined in the same way, and the liquid is conveyed in a single pipe to the expansion valve. Water circulation is effected in such a way as to assist the action of convection. That is to say, cold water enters through an inlet in the bottom of the tank, and as it takes up the latent heat of the condensing gas, rises to the outlet, where it overflows. In this way what is known as the "counter current" principle is adopted. The gas and water flow in opposite directions, and the hottest gas, as it arrives from the compressor and enters the top of the coil, meets the water at its maximum temperature—*i.e.*, at the top of the condenser tank, near the outlet. Similarly the temperature of the liquid leaving the condenser coils at their lowest part corresponds to the temperature of the inflowing water. The difference between the two in actual practice is about 10° with the submerged condenser, although much closer exchanges are found with the other types. The temperature of the gas as it liquefies is thus about 10° above that of the water inlet, but had the liquefaction been carried out at the top of the coil, near the hottest water, it would have been even higher. For then the gas would have been 10° above the outlet instead of above the inlet, and as the former is generally hotter than the latter by another 10°, we have 20° in all as the difference in temperature between the inflowing cold water and the condensing gas. This is radically bad, as the higher the temperature at which the gas is liquefied, the more power does the compressor absorb from the engine or motor which drives it.

It is therefore doubly important that we should have cold water and an efficient condenser; less power is then absorbed and the water consumption is reduced.

For two reasons this particular type of condenser is the least efficient of any. Firstly, the circulation of water, unless there is an abundant and cheap supply, is necessarily slow, owing to the large area through which it flows. It is especially so near the coils, just where it is essential that circulation should be rapid, for there surface friction on the metal acts as a brake and keeps the speed of the water even lower than that in the central stream. The effect is that an almost stationary film is formed on the coil surfaces, and the heat transmission is retarded. Air bubbles also gather, owing to the lack of agitation, and assist in preventing the passage of heat. Secondly, only a small portion of the water flowing through actually touches the coils. This is due partly to the construction of the condenser and partly to the bad circulation. The result is wastefulness, as the greater part of the water is doing no cooling. Hence there are big readings on the water meter.

Notwithstanding these two serious defects, most small machines have submerged condensers. Less floor space is taken up, and the plant can be arranged more compactly. The cost is also less, and the condenser may be placed next the machine instead of on the roof, thus saving in pipe work. But where economy of water must be studied, this type of condenser is useless.

*Double Pipe.*—The second type is an attempt to retain the advantages of the submerged condenser, and at the same time to eliminate its defects. In this object it is partially successful, and for small plants is found to be very useful and compact. The construction of one of these condensers, as made by Messrs. L. Sterne & Co., Ltd., is shown in fig. 15. Instead of a tank being made to contain the coils, the piping is bent into a flat grid and surrounded by an outer tube, larger in diameter, which follows the shape of the grid itself. The result is that two continuous passages are formed. One is through the inner pipe, and is the path followed by the circulating water which flows from bottom to top. The other is formed by the annular space, which lies between the outside of the inner pipe and the inside of the concentric tube which surrounds it. Through this flows the gas which is to be liquefied, its direction of flow being, as in the submerged condenser, from top to bottom, or exactly opposite to that of the water. The principle underlying the two types up to now considered is therefore the same, but the great advantage of the double-pipe condenser is that a much smaller area is allowed for the passage of the water. By this means it is kept close to the coil throughout its circuit, and every drop is made to do the maximum amount of cooling. Hence the effect of a given weight passing through the condenser is greater, and a smaller quantity is sufficient to do the work. At the same time the arrangement takes up very little space, and can be placed next to the machine or fixed to any convenient wall.

Another form of condenser which is really an application of the double pipe principle in a minor degree, is that made by Messrs. J. & E. Hall, Ltd. Here the evaporator is placed inside a cast-iron tank, which supports the compressor, and an annular space for water is thus formed between the two. Condensing coils are placed in this space, and, the path of the water being restricted to the immediate neighbourhood, a certain economy is effected in the amount consumed. This arrangement is diagrammatically shown in fig. 16.

Double-pipe condensers, except in some such form as that just cited, are more expensive than submerged, but owing to their compactness and comparatively low water-consumption their popularity in this country is increasing. In the United States, where they originated, they are universally used for the smaller plants, and even in the larger installations are fairly common.

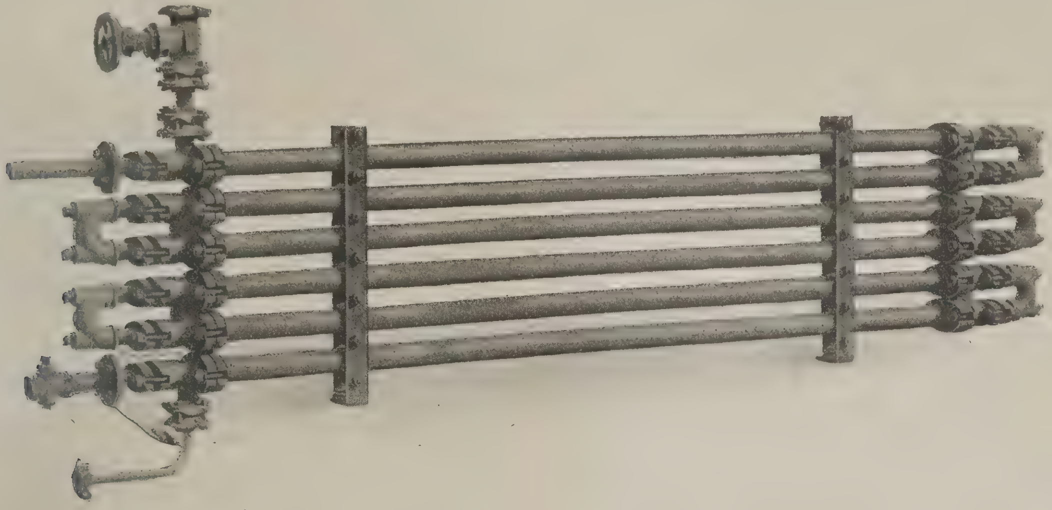


Fig. 15.

*Atmospheric.*—In large installations this form of condenser is used without exception. A typical example, by Messrs. Borsig & Co., of Berlin, is shown in fig. 17. Large flat grids of piping are made, and, as will be seen from the illustration, are built into well-supported stacks.

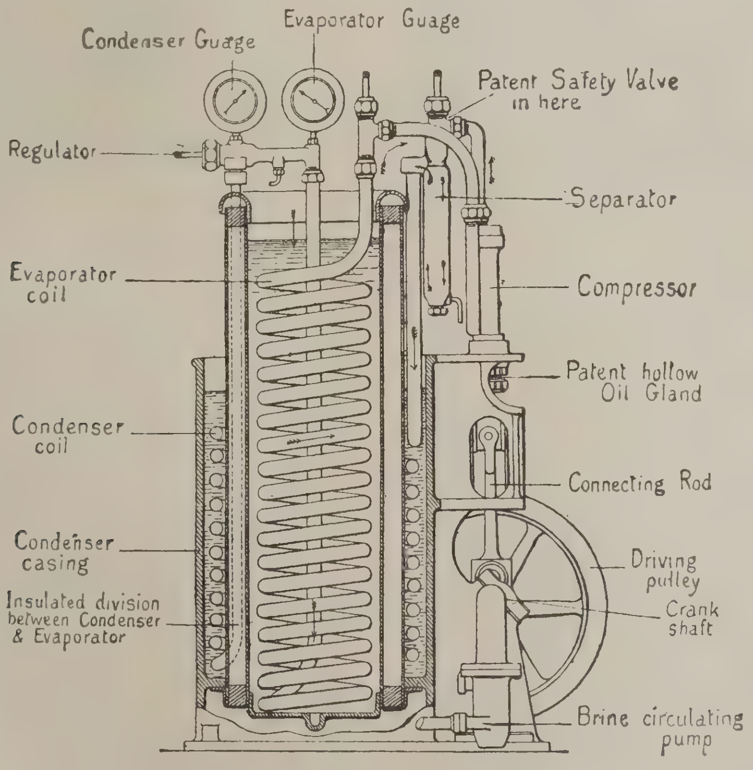


Fig. 16.

The refrigerant (in this case sulphur dioxide) is delivered into the various grids by the long header, or "manifold," seen at the top, and is collected in the liquid form by a similar header at the bottom. The water instead of circulating all round the coils is sprayed over the top by suitable distributing pipes, and allowed to drip from one layer of pipe to another until it reaches the collecting trough at the bottom. In this way small drops are continually impinging on the hot surface of the coils, with the result that a part of the water passing over goes off as steam, and a powerful cooling effect (due to the abstraction of the latent heat necessary to form the steam) is exerted on the refrigerant. From the trough the water is sucked into a pump, hoisted once more to the distributing pipes, and the process is repeated *ad infinitum*. The immense economy effected by this action will be realised by referring to the physical constants already cited for water. Its latent heat of vaporisation at 212° Fahr. is, we find, 966 B.T.U.'s per lb., and the specific heat, of course, is unity. Now in the ordinary submerged condenser the rise of temperature in the water passing through is commonly about 10° Fahr. That is, each pound absorbs 10 B.T.U.'s from the gas inside the coils. But in the atmospheric condenser the water is heated to a much higher degree and then evaporated, and as during the latter operation alone some 900 B.T.U.'s per lb, are absorbed (the exact amount depending on the temperature of evaporation), it will be seen that a very much smaller quantity will perform the same amount of cooling. Unfortunately, however, small losses occur in practice, and the actual economy is not therefore so enormous as it would appear to be from the theory. But, notwithstanding the losses, there is a very real saving, and most atmospheric condensers may be relied upon to take only one-tenth of the water consumed in a corresponding condenser of the submerged variety.

For this reason they are employed in large installations to save running charges, and also in smaller plants where water is scarce. The extra floor space taken up is outbalanced by the water saved, and, as the condenser is generally fixed on the roof, is of no very great importance. About 25 per cent. more piping is used than in the submerged type, and although the circular tank is dispensed with there is the cost of the flat collecting tank, extra stays, supports, water pump, and water distributer to set against it. Hence on the whole the atmospheric condenser is more expensive.

Another form of condenser working on this same principle is sometimes found. It is known as the “ Evaporative ” type, and is used where a confined space is the only location available. The air circulation is then maintained artificially by a fan, and the rest of the construction is very similar to that just described.

*The Refrigerant.*—Vapour compression machines of all types are similar as to general arrangement, and the size of the complete plant does not vary to any extent with the different gases which may be used to fill the system. Each refrigerant, however, demands a certain difference in constructional details, and each has peculiar properties of its own. These are now to be considered.

The three principal refrigerating media are, as already stated, carbon dioxide, ammonia, and sulphur dioxide. All of these are volatile, and under atmospheric pressure exist in the gaseous form. That is to say, if a quantity of one of them were liquefied and then exposed in an open vessel to the air, the liquid would quickly evaporate down to the last drop. Hence to cause liquefaction in the condenser at ordinary temperatures, pressure, varying in amount with each different gas, has to be applied.

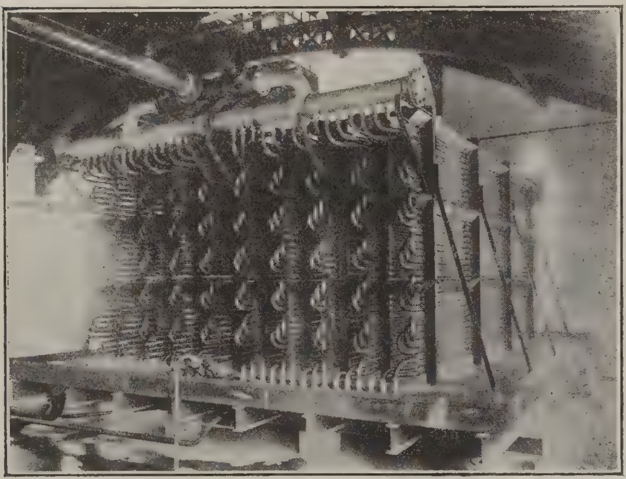


Fig. 17.

*Carbon Dioxide* (*Chemical Symbol, $CO_2$*).—This gas is found almost everywhere, and even forms in small quantities an integral part of the air which we breathe. It is exhaled by all human beings, and, except during the night, inhaled by all plants and vegetables. For commercial purposes it is produced by burning coke, and passing the products of combustion over washing soda, which absorbs the crude $CO_2$ and gives it off under the influence of heat as a purified gas. Large quantities are also formed in breweries during the fermentation of beer, and are now being utilised as a profitable bye-product.

$CO_2$ has no smell, and, except in bulk, is not poisonous. Unfortunately, however, it requires a very high pressure to cause liquefaction, and even in the evaporator, where the pressure is at its lowest, the gauge, if the machine is running on an ordinary store, reads as high as 380 lbs. per square inch. This corresponds to an evaporating temperature of 14° Fahr. In the condenser the pressure is much higher, and, if the gas is condensing at 68° Fahr., must rise to 850 lbs. per square inch before liquefaction is accomplished.

The $CO_2$ machine is therefore somewhat handicapped as high pressures produce high working stresses, and, unless special arrangements are made, cause rapid wear in the moving parts of the compressor. There is also more risk of a leaky joint with $CO_2$, and should a flaw be started in the metal there is just the chance of an explosion. The latter danger, however, is reduced to a minimum by the use of a safety valve, which is set to blow off into the atmospher when the pressure rises to a pre-determined value. This the chief advantage of $CO_2$, as the other gases, while allov ing lower pressures, are penetrating and irritant, with t result that no connection of the system with the atmospher is possible. At the same time, since the relief pressure higher than that attained in ordinary use, there it sti considerable risk.

Needless to say great care is taken in the construction these machines, and at sea, owing to the gas being odourles they are widely employed. But on land, where the smell the gas is comparatively unimportant, they are not popular. This is chiefly due to the high pressure, whic in addition to the disadvantages already mentioned, nece sitates as a compensation for leakages frequent additions the charge of gas originally put into the system. Moreove above a certain temperature known as the “ critical point, no pressure, however high, will cause the gas to liquef Hence where the cooling water available is too hot, C machines are useless.

*Ammonia* (*Chemical Symbol, $NH_3$*).—Ammonia is a we known gas, very volatile and very soluble in water. It prepared by heating various ammoniacal salts in the pr sence of slaked lime.

The pressures necessary are considerably less than tho which must be used with $CO_2$. Taking the conditions specifi before, if the gas is evaporated at 14° Fahr., the pressure the evaporator will be 27 lbs. per square inch, while wi 68° Fahr. as the temperature of liquefaction, 110 lbs. w be sufficient to reduce the gas to a liquid. There is therefo less risk attached to the use of the machine, and leaks are n likely to occur. Further, should any gas escape, it will detected at once by its powerful smell, and the leak will easily located for repairs. No safety valve can be employ owing to the odour (which is exactly that given off by sme ing salts) and irritant qualities of the gas.

The disadvantage of ammonia is that it exerts a corrosi action on all forms of brass, gunmetal, and bronze. No of these metals can therefore be used in the construction the machine if they are likely to come in contact with the g Instead, steel and iron must be exclusively employed, a in certain parts, such as the cocks and valves, this is d tinctly inconvenient.

Ammonia machines have a wide use on land, and America they are employed almost to the exclusion of others. They are also used to a limited extent at sea.

*Sulphur Dioxide* (*Chemical Symbol, $SO_2$*).—This is t gas formed when ordinary sulphur is burnt in air. The p ducts of combustion are passed over lime, and the resulti sulphite of calcium is then decomposed by the action of s phuric acid. $SO_2$ is evolved in a concentrated state, a dried by bringing it into contact with strong vitriol. It i well known preservative, and is also extensively used bleaching.

$SO_2$ permits of lower pressure than either of the two fir named refrigerants, and under the same conditions as th given in the first two cases, the evaporator and conden gauges should read respectively 0 (*i.e.*, atmospheric) a 33 lbs. per square inch. This is a great advantage, a allows of a perfectly safe machine, practically free from danger of blown out joints and leakages. It also relie the wear on the working parts.

Like ammonia, $SO_2$ possesses a penetrating and charact istic odour, and with both there is no difficulty whatsoe in diagnosing a leaky joint. Naturally no safety valve be employed, but at 33 lbs. per square inch this is obviou quite unnecessary. The low pressure also practically obvia altogether the frequent additions to the charge, which so necessary with the high pressure $CO_2$. Another, a indeed the principal, advantage of $SO_2$ is the fact that the liquid form it is an efficient lubricant. The great portance of this lies in the fact that it renders the use of in the compressing cylinder altogether superfluous. For, the cylinder is water-jacketed, drops of liquid dioxide condense on the sides, and will so lubricate the path of piston, which moves in the cylinder, that no oil will be need The mere saving in oil thus effected, although not to be spised, does not count for much, but it is a lasting and s stantial benefit to be free from the trouble of forcing in oil and again extracting it lest it should be forced with gas into the condenser. For the first purpose special lu cators are required, and for the second a large oil separa Neither apparatus is continuously efficient, and seri trouble results, especially with the latter, if there is a bre down. In the $SO_2$ machines both are eliminated.

$SO_2$ has no action on metals, but if water and air allowed to approach it together sulphuric acid may be form

No danger of this, however, exists in practice, as the system is self-contained and perfectly dry.

Machines using $SO_2$ as a refrigerant are widely used in this country and all over the Continent, but, strangely enough, have not yet been adopted in the United States. Their use at sea, for the same reason as that stated when dealing with ammonia, is only limited.

(*To be continued.*)

## RENAISSANCE CHURCH ARCHITECTURE OF THE SIXTEENTH CENTURY IN FRANCE.*

(*Concluded from last week.*)

### *Doors.*

We may now take a few of the individual features of a church, beginning with doorways. The example on the screen is a graceful translation of a Gothic arched door with deeply splayed jambs and many times recessed arch into Renaissance forms. It is the west door of the church at l'Ile-Adam.

The south transept at St. Eustache has a more important doorway with a central pier and with a window above included under the same arch, treated in much the same way as the last. But the growth of Renaissance influence is shown in the desire to enclose this Gothic motive in a square framework.

The west doorway at St. Jean de Losne shows the same desire expressed in more reticent forms.

The west doorway at St. André-lez-Troyes shows a further step. The framework is here treated as more important than the opening. It takes the preponderant place in the composition. This doorway is probably one of the works of Domenico del Barbiere, a Florentine who settled at Troyes and married his daughter to a Frenchman with whom he went into partnership. They collaborated in a number of similar works in the neighbourhood.

The north transept of Ste. Clothilde, at Le Grand Andely, was added about 1540. Its doorway illustrates the translation of a mediæval type into Henry II. detail.

The south portal of St. Nicolas, at Troyes, another work probably of Domenico Fiorentino, illustrates a design made as a whole on advanced Renaissance principles.

The west doorway of St. Nizier, at Lyons, is another fully classical composition of much bolder character. It is perhaps a work of Philibert de l'Orme, and formed part of a scheme for an entire new façade. The use of a great niche as a porch is a conception so majestic that it might well have been more frequently used than has been the case.

The superb doors from the south transept of Beauvais Cathedral are examples of the best Francis I. work at its richest period.

This slide shows one of the celebrated doors of St. Maclou, at Rouen, attributed to Jean Goujon, and extremely characteristic of Henry II. decoration.

The task of translating traceried windows into an appropriate Renaissance equivalent was one of the most difficult which the church designers met with, and led to some interesting solutions. One line they followed was to retain the flowing designs in use in flamboyant Gothic, introducing new forms such as hearts, fleur-de-lys, ovals, into the patterns. This is to be seen in quantity at St. Eustache, where the tracery is one of the weakest points.

### *Windows.*

Another was to return to geometrical patterns while eliminating pointed forms. This may be seen in the choir of the church at Beaumont-le-Roger, in combinations of circles and arches, and in the south transept of St. Eustache in hexagonal reticulated tracery. In the clerestory at Beaumont is rather later tracery, differing from all earlier types by its square, unmoulded section. In one window it is treated as an interlacing ribbon, in another as a monogram.

The rose window in the north transept at Le Grand Andely is perhaps the most successful translation of a free geometrical pattern into Renaissance forms. The tracery is still moulded, and the cusps are composed of foliage.

After about 1530 unmoulded tracery came into fashion, and was largely used in a new type of design which altogether avoids the flowing lines and to some extent the geometrical patterns hitherto in use and simulates slender skeleton edifices. The mullions become shafts and sometimes have capitals; the transomes become entablatures; the tracery takes the form of arches, pediments, circles and scrolls, all of which is sometimes plain, sometimes carved. The left-hand window in this view of Notre Dame des Marais at La Ferté-Bernard shows an example. The same slide shows two types of balustrade, one formed of statuettes in an arcade, the other of an inscription in openwork.

This window from St. Nicolas, at Troyes, illustrates a combination of radiating geometrical tracery with a surface pilaster treatment, while that from St. Jean, at Troyes, shows a skeleton edifice system apparently inserted into a Gothic window opening.

Windows without tracery are almost exclusively used in the advanced Renaissance period, and were found even earlier, as, for instance, at St. Pierre, Caen, till the recent restoration.

The windows on the south face of the south tower at Gisors light the baptistery in its lower storey. The vesica shape above and the two round-headed lights below form a beautiful group and are beautifully detailed.

### *Church Fittings.*

The next group of slides gives examples of church fittings at various periods. This is part of the Francis I. rood screen in the cathedral of Limoges, photographed from the cast in the Trocadéro Museum.

This is an early Henry II. rood-screen from the church of Arques, near Dieppe. The rood-screen by Jean Goujon and Pierre Lescot in St. Germain l'Auxerrois, in Paris, now destroyed, would seem to have somewhat resembled this.

This slide shows a portion of one of the magnificent set of stone screens which extend the whole length of the aisles of the cathedral of Laon, and were put up in the reigns of Henry II. and his sons.

This slide shows a Francis I. font from the church of St. Ouen, at Pont-Audemer, in Normandy.

This is a wooden reredos from St. André-lez-Troyes. Its delicate tracery of foliage and scroll work, its cherubs' head cuspings, and, in fact, the whole of the detail is exquisitely executed. It is gilt with blue backgrounds.

This is another Francis I. reredos in stone from a side chapel in the cathedral at Sens.

The chapel at Ecouen was fitted up by Jean Goujon for the Constable Montmorency. This altar of his design and execution has been removed to Chantilly.

The organ loft, also by Goujon, is still in position at Ecouen.

### *Classic Churches.*

Having run through a number of examples of translations of more or less Gothic motives into Renaissance language and of isolated Renaissance features applied to half or wholly Mediæval churches, we come to those churches of the advanced Renaissance which were designed as a whole in plan and section as well as elevation on Classic lines. I wish it were possible to show you an equally rich series of examples. Unfortunately they do not exist, for the culmination of the advanced Renaissance exactly coincided with the outbreak of the civil wars which brought building to a standstill. No church of any size was designed, still less executed, in this style, and our only examples consist of half a dozen private or mausoleum chapels, of which only the two at Anet are still standing.

The Mausoleum Chapel comes first, though later than the other, because it is the only non-domical one of the group. It was built probably about 1560 for Diane de Poitiers outside the château, to contain her tomb, by an unknown architect.

It does not seem to have been designed by Philibert de l'Orme, but may possibly be the work of Jean Bullant. It is a simple form of basilica, consisting of a rectangular nave with a barrel vault, two square sacristies, and an apse with a semi-dome, and thus forming a rough cross. Its façade is one of the most classical fronts of the century and decidedly monumental in effect. At the Revolution the tombs of Diana and her two children were opened, and the bodies, which were found intact, dragged out. The abundant golden hair of the royal mistress was divided up to make souvenirs for the members of the revolutionary committee who presided over this revolting act.

We turn now to the domical chapels. These all differ from the previous examples of domes in that their plans are entirely conditioned by the dome. One of the earliest was a so-called temple in the park at Villers-Cotterets by Philibert de l'Orme, no longer existing. A circular chamber with hemispherical dome was surrounded by three rather more than semi-circular apses whose domical roofs of corresponding form butted against the walls of the central chamber. The entrance of the fourth side was through a pedimented portico. It was for this portico that de l'Orme invented his so-called French order of banded columns.

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* A paper read at the meeting of the Architectural Association on February 4 by Mr. W. H. Ward.

This slide gives the plan of the château-chapel at Anet, likewise by de l'Orme, built about 1540, and decorated with sculpture by Goujon. Here again we have a circular central space with hemispherical dome. It has four arms with square turrets between them. One arm forms the entrance opening into the cloister of the court of honour and has an enclosed gallery over it. The other three have curved outer walls concentric with the central space. The interior is full of awkwardness—the four arches in winding, the entablatures broken by the windows, &c. There is no independent façade, and the rear elevations are of no particular interest. On the other hand, the construction of the stone dome is so excellent that it has stood unprotected for nearly 400 years.

On the death of Henry II. (1557) Catherine dei Medici instructed her architect, Primaticcio, to design a mausoleum for her husband, her children and herself. This resulted in one of the purest and completest classical buildings that France ever possessed. It was begun in 1570, but was unfinished when the Valois dynasty came to an end with the murder of Henry III. The Bourbons did little to it and it fell into disrepair, and was destroyed by the Regent Orleans in 1719. It stood on the north side of the abbey church at St. Denis and was entered from the transept. The royal tomb occupied the centre; those of the other princes were to stand in the trefoil chapels which radiate from it.

Over these a gallery ran round the upper part of the central hall, which had a hemispherical stone dome itself covered by an independent timber dome, the first of its type in France. The elevations, treated in a manner recalling those of the Louvre, were excellently proportioned and doubtless beautifully detailed. The interior was enriched with coloured marbles and the work of the great sculptors of the day. The tomb of Henry and Catherine can still be seen in the abbey. The monument as a whole was a worthy resting-place for the ashes of the Valois kings, whose love for art had so large a share in endowing France with the glorious buildings of her Renaissance in its various stages.

In conclusion I would only remark that whatever my hearers may think of the opinions I have expressed, some at least among them may have been convinced by the slides, if they were not so already, that the Renaissance church architecture of France is one which may be studied with profit and with desire to visit its examples.

Mr. J. W. Simpson, who proposed a vote of thanks to Mr. Ward for his lecture, congratulated the Council of the Association on their remarkable success in procuring interesting papers for the fortnightly meetings. He hoped Mr. Ward's lecture would be printed with illustrations, since he was of opinion that it was of the greatest importance to students of architecture that they should study and learn design and history together, and that exercises in the styles of particular periods should be comparative. Continental works should be examined with examples of English architecture at corresponding epochs, for unless some such method was practised the standard of their criticism, which really meant their perception of the beautiful, was certain to become extremely cramped and insular. It was also true that without some knowledge of the history of the people who lived during the different periods, of their customs and costumes, the buildings would never give up to the student their real meaning and interest. Many were disposed to divide the study of architectural design into two parts, on the one hand the architecture of their early practice, dealing with the picturesque possibilities of the pigstye, and on the other hand there was the design which they had to get up for examinations, but for which there was no real use afterwards. For such they must grope in dreary musty volumes containing letterpress in unintelligible tongues, to perhaps recognise some of it with surprise when later on they travelled abroad. The paper they had heard that evening in its logical and historical development of Renaissance church architecture in France was a very good example of a constructional method which might be followed in the study of design, and the speaker therefore commended it as a guide for students of the Association.

Mr. Edward Warren seconded the motion. The study of French Renaissance, he said, had always been one full of charm and interest to him, and the more so because it was interesting to follow a contrast of chronological instances in other countries. The difference between this country, due to our insular position, and France, was very marked. Mr. Ward attached the date 1507 to one of his illustrations, and that was exactly contemporary with the middle period of the building of the great tower of Magdalen College. That building, although it dragged on into the sixteenth century, was pronounced English Gothic without a touch of the Renaissance. There were in England some very striking instances of refined French work—at Christchurch, in Hampshire, the Salisbury tomb; the monument of a warrior dated 1357 in Brede Church, Sussex, Chelsea parish church, and King's College, Cambridge. As to the sequence of the French Renaissance dealt with by Mr. Ward, the most interesting periods were the beginning and the end. A great deal of French Renaissance work of the middle period was foolish and crude. It was certainly not good architecture, because the first quality required in architecture after ordinary structural expression was that of inevitableness—a function performed in a proper way.

Mr. Alan Potter, in supporting the vote of thanks, said while he had great admiration for Mr. Ward's knowledge, he had considerably less admiration for the subject of the lecture. Early Renaissance work in France was a struggle between the Gothic principles of construction and the Italian Renaissance principles of design, by overlaying pseudo Classic detail developed on a different basis of construction. It was a struggle in which the Gothic principles held their own and never entirely disappeared. In all the early work such as that of Francis I. and Henry II. the best examples were clearly those in which the Gothic idea was manifest. The subject, he said, struck him as being of more interest to the student of religious and social history, rather than to the practice of architects of to-day. It seemed to him that the direct lessons were nearly all in the negative of what not to do. He felt that the commencement of the Renaissance was the commencement of a time when people had to be educated up to things—it was a struggle between the self-conscious and the sub-conscious elements.

Mr. H. P. G. Maule supported the suggestion as to printing the paper with illustrations, for in such a form it would be of great use in the school. He agreed also with the importance of making students design in style, taking classical, or whatever periods they might wish, and making the students design more or less on those lines and principles. To do that properly, and obtain the best results it was most desirable that the students should have a clear exposition of the historical development of the style they were studying. Mr. Ward's lecture was admirable, and its value to students could not be overrated.

Mr. Rudolf Dircks supported the vote of thanks, which on the motion of the President was passed by acclamation.

# ILLUSTRATIONS.

### ST. PAUL'S CATHEDRAL, MELBOURNE.

By special permission we reproduce one of the working drawings of the late Mr. William Butterfield that were exhibited at the Architectural Association on the occasion of the lecture by Mr. E. Swinfen Harris, F.R.I.B.A., which is reported in our columns this week.

### THE TOWER, DODFORD.

This house was built from the designs of Mr. Arthur Bartlett, F.R.I.B.A., and was described in our issue of January 28.

### CATHEDRAL SERIES, LLANDAFF.—NORTH SIDE OF CHOIR—INTERIOR.

This view, forming part of our series of Llandaff Cathedral, shows much of the work of Mr. Pritchard.

Many of our readers, to whom he is well known, will regret with us to hear of the serious illness of Sir Thomas Drew, who has undergone an operation for appendicitis.

On Monday evening, February 14, Mr. J. Cruickshank Smith, B.Sc., F.C.S., delivered the first of a short course of three lectures on "Paint," to the students in the Polytechnic architectural classes. There was a good attendance, between forty and fifty students being present. The subject was "Painting grounds in their relation to the suitability and permanence of various paints." The lecturer, after referring to the importance of considering the ground or surface on which paint was to be applied, and the failures that occurred through lack of attention to the subject, dealt in detail with the grounds or surfaces commonly met with in practice, viz., wood, stone, brick, plaster, cement, iron and steel, and galvanised iron. The theories underlying the treatment of these surfaces were explained, and many practical hints were given.

## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at the premises in Tufton Street, Westminster, Mr. H. TANNER, F.R.I.B.A. (President), in the chair.

The HON. SECRETARY announced the fourth spring visit, fixed for February 26, to the Sir John Cass Institute and School, Jewry Street, Aldgate, by permission of the architect, Mr. A. W. Cooksey. A visit will afterwards be paid to new offices in Austin Friars Square, at 3 P.M., by kind permission of the architect, Mr. M. E. Collins.

At a meeting of the Camera and Sketching Club to be held on March 3, at 7.30 P.M., Mr. John Gaymer will contribute a paper entitled "Mediæval Roofs."

On March 11, at 7 P.M., the Debating Society will hold a joint meeting with the Art Workers' Guild. Mr. A. R. Jemmett will read a paper on "The Study of the Crafts in Relation to the Practice of Architecture."

Messrs. A. S. Bennett and A. T. Edwards were elected members.

Mr. E. SWINFEN HARRIS, F.R.I.B.A., read the following paper entitled—

### The Life and Work of William Butterfield.

As one of your oldest surviving members I feel that it is not only an honour, but a rare pleasure too, to be called upon to say a few words about the life and work of this very remarkable man, and to give you, so far as I can do so justly and impartially, some small contribution towards the still unwritten complete memoir of a great and self-repressing architect, well known, it is true, to most people in the art world, in and through his many buildings, but of so retiring a nature as to be all too little known and remembered by the multitude in any other way; his work is, always has been, and, I fancy, always will be, studied and enjoyed by thoughtful souls.

Let me try to speak of him in a threefold sense: architect, man, friend.

William Butterfield, F.S.A., was born in Gordon Square, London, on September 7, 1814; he departed this life on Friday, February 23, 1900, at his residence, 42 Bedford Square; he was buried on the Friday following, March 2, in the new and added portion of the churchward of the parish church of Tottenham, next and immediately in the rear to the west of the grave of his attached friend, the Rev. Prebendary Arthur Wilson, a prebendary of St. Paul's Cathedral; their tombs are evidently both from Mr. Butterfield's designs, and are very nearly alike both in form and detail.

Some of his best architectural efforts have been already well described, illustrated, and criticised in an admirably written article which appeared in the *Architectural Review* for June and July 1900; an excellent and life-like portrait is given with the letterpress of the memoir over which Mr. Halsey Ricardo has, in his thoughtful critique, in no one particular spared himself; also by other writers in other places.

I suspect that it will never be revealed to us what were the principles at the back of Butterfield's busy brain guiding him so well towards the faculty that produced his many wonderful buildings with their numerous peculiar methods and details; that he had principles and good reasons for all that he did no one knowing him at all would or could have the very smallest doubt.

It has been my great good fortune not only to see and handle very many of his carefully-made drawings, so full of the results of deep thinking as they one and all are, but also to visit and carefully examine the following buildings of his:—

All Saints Church, Clergy House, Choir School, and the Parochial Schools (slantingly opposite to these) in Margaret Street.—Mr. Ricardo has summed up the salient points, but it may be of some interest to you to know that his designs and drawings for this church were on view in the first Great Exhibition of 1851. I was there, too, but being then only ten years of age, and perhaps remembering it all the better because I spent my birthday in it, I could hardly be expected to appreciate them then as I do now, even had I then seen them.

The School Chapel, School Buildings, Gymnasium, Racquet Court and Fives Courts, Rugby School.—All these works are excellent; the way in which the many difficulties as to the chapel in so limited an area were overcome so cleverly are a great sign of his patience, which must have been tried by the insistence of the retention of many of the hallowed if incongruous features; his loyalty to instructions has resulted in the production of a noble structure, lofty and spacious within and full of dignity without.

The Re-building of St. Andrew's Parish Church, Rugby.—Here, too, he was seriously hampered in having to incorporate an old tower with his new work, but the success achieved shows that this difficulty proved in the end a great sign of his power; his own tower and spire rise nobly at the other end of the church. The retention, too, of the old nave as an aisle is a very clever piece of work; the two hagioscopes recall his earlier sympathy with old methods, specially when, as here, they could be made subservient to his needs. This work was done in 1870; the new tower and spire later on, and statically the better in consequence, the foundations belonging to the date mentioned.

The Church and Clergy House of St. Alban the Martyr, Brooke Street, Holborn, 1861-2.—A truly noble, dignified, and well-arranged church; its west end specially reveals the work of a master mind, embodying great height and scale: when for a short time only it was visible to the passer-by it was a revelation little likely to be forgotten by those who enjoyed it. Professor Pite has well recorded that event.

Balliol Chapel, Oxford, which, in spite of the late Lord Grimthorpe's hard words in his "Book on Building," is a fine piece of design; after all, perhaps, had Mr. Butterfield's reasoning been asked for an answer might have been forthcoming for what he did; be that as it may, the persons who paid for it could have objected had they seen good cause for so doing; at St. Albans Cathedral the objectors not being the paymasters were not listened to.

St. Matthias, Stoke Newington, 1851-3, was an early work of his, full of that quiet grace and dignity so needful as aids to true devotion; the ritual arrangements here, as elsewhere, are admirable.

Keble College, Chapel, Dining Hall, &c.—The chapel, built by the lavish generosity of Mr. Gibbs, of Tyntesfield, and containing among its treasures Holman Hunt's "Light of the World," besides its importance as a vaulted structure, shows the aloofness of its architect, his independence of action, and his disregard of precedents, specially in his resistance of old methods in not placing his congregation choirwise, but preferring to treat the matter parochially for the simple reason that Keble was, in a sense, different in so many ways to the older foundations; good proportion as here shown is as necessary to success as is that of mere loftiness; the value of arcading both inside and out is noteworthy; his conviction that the subject from the Apocalypse that he had chosen for the great quatrefoil over the altar was the only one suitable to the iconographical scheme leading up to it, was, after much serious consideration, so logically defended by Mr. Butterfield that the authorities felt bound to adopt it; the supernatural in art is always more or less difficult to handle.

St. Ninian's Cathedral, Perth, N.B. (1851) (since completed by the late J. L. Pearson, R.A.), a very thoughtful and beautiful creation throughout, and set in lovely surroundings.

Fulham Palace Chapel, which most of you probably know very well (1860-67).

Works in the church of Ottery St. Mary, Devon, and the New House of Lord Coleridge, "Heath's Court," hard by it. —This house is full of suggestion, and "racy of the soil."

A Parsonage House in Burleigh Street, Strand, which most of you probably know, at least from the outside; the plan, in a confined area, is very clever.

All Saints, Babbacombe.—A church glowing with the marbles of the beautiful county in which it is placed.

Buildings in Winchester and St. Cross.—These have been carefully described and criticised already.

A New Church at Newbury.—A thoughtful and interesting piece of work; of some of the stained glass noticed when I visited it, perhaps the less said the better.

Chapel for St. John's College, Battersea, and New Parochial Schools there.—These you probably know, so I leave them for others to criticise. The chapel has been recently dealt with by my old friend and pupil, Mr. A. H. Ryan Tenison.

St. Augustine's Church, Queen's Gate (1871).—In this church, as in that of St. Andrew's, Rugby, both works of his later years, he evolved what, for want of a better term, may be called the open stone rood, by cutting off the apex above the chancel arch, and raising the rood on high over and upon its horizontal line; whether it will have an abiding influence remains to be seen.

The Old Home and Chapel of the S.P.G. (1871), since rebuilt on another site hard by from the designs of Sir William Emerson, showed some of his quaint and most original dealing with brick patterning.

I have also been privileged to see many additions to houses for clerics, in one of which as a guest I could but notice that the same pains seem to have been taken as with the works of similar character in his more costly buildings where such survive.

So far as I know they one and all fulfil very completely the object of their existence.

I have also examined the drawings, but, thus far, have not visited the following buildings designed by him:—

Melbourne Cathedral (1884), the drawings of which are on the walls. If you refer to these drawings you cannot fail to note his intense zeal and care over his work there, inasmuch as he sent out as a guide a complete principal from England not merely as a pattern for the production of the other principals, but also to make the masonry of the weathering efficient in keeping out the elements; the wording of the instructions in simple language leaves no possible room for doubt as to his intention and meaning.

St. Augustine's College, Canterbury (for the late Mr. Beresford Hope).

Ascot Priory Church.—This was done about 1865.

Churches at Belfast, at Enfield, Studley (Oxon), Bexhill, Isle of Cumbrae, together with very many others, as well as houses and schools all over the country.

St. Clement's, City Road (1882).

*List of Works from the "Builder."*

Merton College, Oxford, sixteen sets of rooms and restoration of the College chapel; St. John Evangelist, Broad Court, Covent Garden, rearranged; Baldersby Church, near Thirsk; Bookham Church, Surrey; St. Matthew's Parish Church, Ashford (1859); St. John Evangelist, Hammersmith (1859-60), tower, 1881; All Saints, Harrow Weald; St. Edmund, King, Lombard Street, restored and repaired; All Saints, Highgate (1864); Christ Church, Albany Street, N.W., remodelled; St. Michael, Paternoster Royal, E.C., restored; St. Leonard, Shoreditch, restored; St. Thomas, Regent Street, interior refitted; St. James, Shoreditch, repaired and decorated; St. Barnabas, Rotherhithe (1872); St. Clement, Eastcheap, internal rearrangement; St. Paul, Covent Garden, internal rearrangement; St. Mary, Brookfield, Highgate (1875); St. Mary Woolnoth, E.C., interior remodelled; All Hallows, Bruce Grove, Tottenham, restored and enlarged; St. Mary, Rotherhithe, additions and improvements; Christ Church, Endell Street, restored (1877); St. Michael and All Angels, Woolwich, nave (1878-9); Exeter Grammar School and Chapel (1881); St. Philip, Dalston, restoration; St. Paul, Bunhill Row, restoration; St. Mary, Edmonton (1884); Holy Innocents, Kingsbury, Middlesex; St. Mary, Warwick, restored and partly rebuilt (1884-91); St. John, Smith Square, Westminster, altered and repaired; Gordon Boys' Home, Bagshot; St. Paul, Rotherhithe, restored (1892); Parish Church, Hathersage, Derbyshire (the "Morton" of Jane Eyre); Chapel, Guards' Depot Barracks, Caterham; St. Mary Magdalen Church and Vicarage, Enfield; St. Bartholomew, Pinchbeck West, Lincoln; Christ Church, Hoxton, interior rearranged; St. John Baptist Parish Church, Barnet, additions; St. Philip, Clerkenwell, refitted and improved; St. Luke, Sheen, in the Staffordshire Moorlands, completed; Northington Church, Hants, improvements; Theological College and Chapel, The Close, Salisbury; St. Mary, Dover Castle, restoration; Tottenham Parish Church, restoration; St. Michael's Hospital, Axbridge; St. Augustine, Bournemouth; St. Thomas, Leeds; Ardleigh Church, Essex; St. Mary Magdalene, Munster Square.

Winchester.—Buildings and restoration of St. Mary's College Chapel; the County Hospital; St. Cross, restoration of nave (1860), brass lectern, and altar rails.

His churches have been called prayer-books in brick and stone.

If judged merely as drawings they leave little if anything to be desired. I may say this much, that the buildings seen and the drawings examined have given undiluted pleasure to myself.

(*To be concluded.*)

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The Paisley Town Council are taking steps for the improvement of the surroundings of Paisley Abbey by the demolition of some old property in its immediate proximity.

The Council of the University of Liverpool have appointed the following External Examiners for the year 1909-1910:—Architecture: Reginald Blomfield, A.R.A., F.S.A., Honorary Fellow of Exeter College, Oxford, and Professor of Architecture at the Royal Academy. Civic Design: H. V. Lanchester, F.R.I.B.A., Secretary to the Town Planning Committee of the Royal Institute of British Architects.

## ROYAL ACADEMY LECTURES ON ARCHITECTURE.

In his course of lectures last year at the Royal Academy, Mr. Reginald Blomfield, A.R.A., dealt with "Early French Renaissance Architecture," tracing its development from the time of advent of the Italian craftsmen until the death of Francis I. In his course for 1910, Mr. Blomfield resumed his subject at this point. The first was delivered on Monday, February 14, and dealt with—

### Philibert de l'Orme.

Francis I. died in 1547. His death closed a definite period of history and released forces which had lain in abeyance. A man of restless energy, considerable capacity, and the instincts of an artist he took the control of the arts into his own hands and, as far as possible, designed his own houses. Trained and competent artists were thereby reduced to being little more than servants of the Royal whim; and the exotic Renaissance was dependent on his patronage and the caprice of the Court. No first-rate Italian artist would stay long in France. The result was a series of false starts; and, when he died, architecture had advanced but little in thirty years, unless it was in a widely diffused interest in the art and possibly a growing consciousness that architecture meant something more than a series of futile variations in detail.

His son and successor, Henry II., was on the other hand a morose and melancholy man whose absorbing passions were hunting, violent exercise and, greatest of all, Diane de Poitiers. Caring little for the arts he handed over their direction to deputies; and thus came the opportunity of the younger generation.

There had been growing up at this time a class of men, who, different to the somewhat unscrupulous master-builders, had deliberately devoted themselves to architecture. They had qualified themselves by a study on the spot of the antiquities of Rome, and they applied the new enthusiastic learning to research in ancient monuments.

Such a man was Philibert de l'Orme, the most brilliant of all the artists who rose up after the death of Francis I. The son of an unimportant contractor, he was born at Lyons about 1515. He found his way to Rome and joined the host of other artists occupied in studying its antiquities. One day while busily engaged on the Triumphal Arch of Santa Maria Nova, he was accosted by some of the papal court who had noticed his industry in measuring with great minuteness the ancient buildings. The young man was introduced to Pope Paul III., who put him in charge of a church in Calabria. This he threw up in 1536, and returned to Lyons under the patronage of the powerful family of the Du Bellays.

His first important commission was for the Château de Saint Maur des Fossés, near Vincennes. The site was a filled-in quarry, and De l'Orme sunk shafts about 4 to 5 feet square and 12 feet apart, down to the firm ground 40 feet below, and built up piers of masonry, and arches from pier to pier to carry the works above. This marked an important advance towards scientific construction, and makes one of De l'Orme's strongest claims to be regarded as an architect. The constructor in him was always stronger than the artist. The design itself in its quiet treatment and good proportion shows traces of his Italian study. Indeed, it is doubtful if he ever got back to its fine austerity. The building, however, was never completed by Du Bellay.

One of the first acts of Henry II. on his accession was to displace Serlio and appoint De l'Orme, then holding another Government post, architect to the King and inspector of all the Royal buildings. His commission to inquire how Francis I. had been served was plenary, and he set about its discharge in that drastic spirit which rendered him ultimately one of the most unpopular men in the country. In his uprooting of corruption he seems to have felt an exultant delight in the reckless exercise of power.

Throughout the reign of Henry II. he enjoyed unbroken prosperity. The statement of his enemies that he had been in receipt of 20,000 livres was indignantly denied by De l'Orme, who declared his expenses were enormous. His refusal to contribute to the rebuilding of one of three abbeys of which he was abbé brought him into the courts, where he lost his case.

At the chapel at Villars he first used his invention of the French order, i.e., a column with bands of ornament at intervals up the shaft so as to conceal the joints of the stone. It is one of those wrong-headed inventions a finer taste would have rejected.

De l'Orme was employed by Diane de Poitiers to design the great house of Anet on the Dure. He was given a free hand and practically carte blanche, and the half of it that remains is typical of his manner. There is much that is admirable in it: the general conception of the quadrangular plan is fine and even masterly, and for the first time one can trace a real attempt at rhythmical composition. Meanwhile he was engaged on the important monument of Francis I. in the church of St. Denis. This much admired design seems "too architectural," i.e., there is too much reliance on mouldings and details.

The death of Henry II. by a thrust in the eye at a Court tournament, in 1559, brought an immediate and disastrous change to De l'Orme's fortunes. Even before the King's burial he was replaced by Primaticcio. After an impetuous but futile protest he commenced to write his curiously personal "Nouvelles Inventions"—that immense and first really practical treatise on architecture to which he owes his most enduring reputation. He did not live to complete this encyclopædia of architecture, in which he was to state the result of his own studies and long experience.

De l'Orme was, however, allowed at least one more great chance. Catherine dei Medici employed him first to complete his gallery 180 feet long across the Cher at Chenonceaux, and then in 1564 to design a vast pleasure house on the outskirts of Paris—the Palace of the Tuileries. His ill-fortune followed him. The works at the Tuileries proceeded fitfully from lack of funds. All that he lived to complete was the centre part of the east façade with its great staircase, and Catherine's interference hampered him throughout. When the poet Rosnard, who had always looked down on De l'Orme as a successful upstart, insulted him in the Tuileries, the unpopular architect was severely snubbed by the Queen Mother.

De l'Orme died on January 8, 1570. He had revolutionised building methods in France. As an engineer he was in the front rank of his time; but as an architect he was entangled with details, and lacked a clear conception of architecture as an art. His work was never spontaneous, never the result of a full and living imagination. Yet the Tuileries was the first of the great palaces of Europe, and when fifty years later Inigo Jones was called upon to design Whitehall, he did not hesitate to follow De l'Orme's plan in its general lines, though not the Frenchman's elevations. But, after all, it is not intellect only or even imagination that always wins the day. By force of character De l'Orme fought his way to the front, and has maintained a place among the great Frenchmen of the sixteenth century.

The second lecture was on

### Jean Bullant.

Jean Bullant was the most original thinker in architecture that France produced in the sixteenth century. He is believed to have been born at Ecouen about 1515. Practically nothing is known about his early training except that he got to Italy. He was possibly sent there by Anne de Montmorenci, Constable of France and Lord of Ecouen, who employed Bullant, among a galaxy of artists, on his castle at Ecouen. It was in the company of men like Jean Goujon, Palissy, Abaquesne, and the Lescots, that Bullant learnt his art and absorbed the best of their influence.

The arrogant Montmorenci was content with nothing less than the best and newest thing that wealth and a great position could obtain for his surroundings. The main block of the castle, including the chapel (for which Goujon made the famous altar, now at Chantilly), was begun by Charles Billard, and probably completed before 1540-2. Bullant's work is certainly subsequent to that date. There are indications that it was not consecutive, and probably Bullant journeyed to Italy in the intervals of his employment.

Bullant's work is unequal and uncertain. He had an exceedingly arbitrary master; and this may perhaps account for the manner in which he pitchforked his neo-Classic into the middle of a Francis I. design. The south façade shows signs of most violent changes. It almost looks as if the Constable had made experiments on it, and allowed them to stand, for no architect left to his own devices would have tolerated the jumble. His most satisfactory work is the frontispiece on the inside of the court through which passes the corridor to the terrace front. It is in two storeys, with a curious triple-storey dormer. Regard has been paid to the earlier work, as Bullant kept his string cornice lineable with the earlier strings. But his constant search for fresh motives in design is shown throughout the whole composition, especially in the broad handling, the treatment of the piers, the deep shadows of the continuous entablature, and the play of light and shade by other means than the familiar open gallery given in the columns at the end and the central pier. The actual masonry itself is notable. The space between the columns and the central pier was much too wide for a lintel, and Bullant, probably for the first time in France, treated his lintel as a straight arch, running his voussoirs through both architrave and frieze. Bullant was the first French architect to let his mind play freely on his design as a whole, to think of it not in detail, but as a matter of planes and masses. He was also the first of the new Classical men to handle architecture as an art, complete in itself, with its own technical conditions, and its own peculiar ideals. He was fortunate in having an employer who saw large, a man of a certain magnificence of temperament, as well as of prodigious wealth.

The Constable possessed at Fère en Tardenois a fine thirteenth-century castle. Between 1550 and 1560 he employed Bullant to throw an immense viaduct across a deep gorge separating this house from a plateau admirably adapted for the housing and drilling of troops. The whole scale of the bridge is heroic, very simple and very grand; it has more of the Roman quality than any other building of the time. Five semi-circular arches with piers 22 feet thick carry a two-storeyed gallery some 200 feet long at a height of over 100 feet above the bottom of the gorge. The building is now ruinous, having been broken up in 1779 by Philippe Egalité in order to pay his creditors and win favour with the populace. It is still, however, one of the most impressive fragments of French neo-Classic; and its stark masculine and unaffected architecture is the fit expression of two remarkable personalities.

In 1557 Bullant obtained his first official promotion, being appointed controller of building operations, with a salary of 1,200 livres a year, "Comme personnage grandement expérimenté en fait d'architecture." The duties were to control the workmen, measure their work, and see if they had complied with the terms of their contracts. Philibert de l'Orme, architect to the King, and then all powerful in the arts, grudged Bullant this one ewe lamb, and secured half the salary for his own brother Jean. When the King died eighteen months later, Bullant was swept out of Court, and retired with Montmorenci, who was also in disgrace, to Chantilly. Here he designed the châtelet which stands on a small island to the south-west of the Constable's château, and is in communication with it by bridges on both floors. Bullant was allowed here a perfectly free hand, and the châtelet summarises all the peculiarities of his manner. It is the only complete building by him that has survived.

Nothing is known of Bullant's work between the completion of this châtelet and 1570, when he succeeded De l'Orme at the Tuileries. In his enforced leisure he took to writing. His first book, on sundials, appeared in 1561; it was followed in 1562 by a second part dealing with geometry. Both were dedicated to the "high and mighty Lord, My Lord the Duke of Montmorency." Then followed a treatise on the Five Orders, according to the rules of Vitruvius, which ran into four editions.

His appointment on the death of De l'Orme brought a salary of 500 livres a year, a notable decline from the 1,200 livres drawn by De l'Orme and Primaticcio. It is probable, however, that he was paid independently for other work, and he is supposed to have succeeded Primaticcio as controller of the Royal buildings.

Bullant was at once engaged on continuing the great scheme for the Tuileries inaugurated by De l'Orme. He was not content with following the original design, but introduced some of his own devices, though the transition from De l'Orme's lower building to the higher façade, which Bullant designed, is managed skilfully and harmoniously enough. In 1572 Catherine dei Medici stopped the building there in consequence of a prediction that she would perish under the ruins of a house near St. Germain, and it was in that parish the Tuileries stood. He was finally employed to rebuild the Hôtel de Soissons, now destroyed. Bullant died in 1578, a month after the death of Lescot.

Of the famous trio De l'Orme, Bullant and Lescot, Bullant was the finest artist. Starting with less advantages, his natural genius carried him to a point of attainment never reached by the other two. Lescot's buildings are dull and only saved by Goujon's sculpture. De l'Orme mistook knowledge for imagination and fell into the snare of archæology and of an over-rigorous science. Whereas in Bullant's works it is possible to trace a definite idea, a serious attempt to realise a great architectural conception, he alone realised the true fascination of architecture as the art of great forms and rhythmical proportions, and allowed his imagination to move in large spaces. He was, moreover, feeling his way back to the national austere restraint.

It is not so much on his actual attainment as for his brave endeavour and respect for his art that Jean Bullant ranks with Goujon, the sculptor, as one of the bright particular stars of French art in the sixteenth century.

## NATIVE CRAFTSMANSHIP IN TIMBER, BRICK AND STONE BEFORE THE EIGHTEENTH CENTURY.*

*(Concluded from last week.)*

CRAFTSMEN should possess in no small degree the power of invention and knowledge of form and light and shade, which are essential to the painter, with this important difference, that the one produces his effects from the palette while the other creates his out of solid materials. Mullions well placed in relation to the wall face, string courses at the right levels, and label mouldings over windows, when carefully introduced, give brilliance to a plain surface which otherwise might be dull and uninteresting.

The walling may be—and often is—comparatively rough, built of unsquared stones, or—as at Great Chalfield, Wilts—of small stones brought to irregular courses; but the wrought work needs to be carried out with all the more thought and care, and well-defined mouldings and carving show up as precious beside a comparatively rough setting. There are few more thoroughly English and more completely satisfying stone houses than this old manor-house with its stone roofs and sculptured finials, full of spirit and redolent of the best days of native craftsmanship.

In no one particular feature is the free and romantic spirit of this late mediæval work more clearly seen than in the sculptured finials perched high at the apex of a gable or crowning a pinnacle as at Mapperton. These have not been touched since they were set up nearly 400 years ago, and they are as full of fire as the day they came from carver's chisel, heraldic in motif as most of the carving and ornament is at this date. But wherever Ham Hill stone could be obtained we find ashlar walling in large blocks with fine joints, instead of unwrought walling, and nobody knew better than the craftsmen of old that so beautiful a material could be relied upon to tell its own story with very little, if any, help from the carver. A single spot of carving on a plain wall, such as a crest projecting slightly or a panel sunk ever so little, and containing a shield or coat-of-arms, was more often than not depended upon to give a character which is much more expressive than results, as a rule, from a lavish display of decorative detail.

On one of the noblest houses of all, Barrington Court, one seeks in vain for a single piece of sculptured ornament, and yet there is beauty and dignity beyond words to express, resulting from the straightforward, honest use of the material. This is a house which, as regards disposition of plan, shaping of masses and execution of detail, is as natural as the Ham Hill stone of which it is built.

On a far smaller scale, but equally eloquent of this principle of reliance upon good building, rather than upon display of detail is Eason House, near by. This unbroken front might well be taken as a model by the builders of to-day who are so apt to lose themselves in pretentious design. It is about 74 feet long, and shows what can be done with good proportion and simple detail; projecting labels, which are continuous over the two groups of windows, with ends turned down over the lintels, being the only relief. It is not quite symmetrical, the doorway being out of centre. The thatched roof fortunately survives, and there is no doubt that the roofs to many old houses which are now covered with machine-made tiles or thin slates were covered originally with thatch or with thick stone slates.

In these quiet stone houses much depends upon the section of the stone mullions and their position in relation to the external wall face. Thin mullions, or what comes to the same thing, lights too wide, are sure to produce a meagre and wiry effect, and the old masons seldom erred in this respect, and it is very interesting to notice the different sections and the changes in the form of the head of the light.

Although mediæval buildings owe so much to the wealth of stone traceries, the difficulties of glazing and of providing shutters or casements to fit lights with intricate heads, in due course resulted in the abandonment of traceried heads except in the upper parts of oriel or bay windows, for the simpler flat-arched type, which the native builders loved so well, or for the still simpler square head, which persisted until it was eventually ousted by the introduction from abroad of the wooden sash window. With tracery or the flat arch, the section of the mullion invariably shows the hollow chamfer, but with the square head the convex form was general, while in the best work in districts where good free stone was available, an additional member was often worked. These mullions are set back seldom less than $2\frac{1}{2}$ inches or more than 6 inches, the larger mullions alone being brought out to the wall face. The example from Sandford Orcas is quite typical of the Ham Hill district; in the North of England a plain splay is much more commonly met with, seeing that the hard sandstone would have necessitated such an expenditure of labour to mould. It is not nearly so effective and gives a hard feeling to many a fine house. At Skipton Castle is a remarkable example of the influence of local material and of the work of craftsmen who brought their methods from the South.

The courtyard front of ruined Cowdray shows all these types of window head side by side. There is no more inspiring ruin in England, and it is to be sincerely hoped that nothing will be done to it to rob it of its beauty.

Between the two bay windows of the courtyard at Skipton, Yorks, is one of those panels of heraldic sculpture which native carvers carried out with so much spirit. There is no doubt that the Italian carvers, who were present in this country in numbers long before the Renaissance came to maturity, were able to teach much by their more delicate modelling, by their wider range of decorative detail, and, above all, by their knowledge of the human figure, which the native carvers seldom attempted; but whenever straightforward heraldic carving was needed to fill a panel, a spandrel, or to shape a finial, there was no lack of creative power.

The bay window and the oriel were in particular singled out for elaboration in these native-built houses, and they gave opportunities for the display of skill in many materials. As may be supposed, the finest examples are executed in stone, and in brick districts stone is used for the wrought work almost exclusively.

At Rye House are two projecting windows, carried on brick corbelling well designed, on quite different lines from the stone corbelling, as it should be.

At Kirtling Tower, Cambs., is a particularly fine oriel carried out in stone upon a brick structure, with fine moulded and enriched corbelling. The whole of this is circular work, the lights being 12 inches wide. It is more usual to find straight-sided oriels, with the corbelling carefully profiled so as not to give a weak line of intersection with the wall.

A very favourite position for these oriel windows was over the principal entrance archway, whether in gateway or porch, and at Cerne Abbas and Forde Abbey, in Dorset, magnificent ones are to be seen with traceried heads to the lights and carvings in the hollows of the mouldings.

At Holcombe Court there is a very bold one, three storeys in height, starting as usual above the archway of the principal entrance and carried right up to the parapet. Being later in date than the last one, we find the lights have no tracery, but the plain arched head. Local stone for walling, with finer grained and lighter-coloured limestone for dressings. Relieving arch over windows.

The detail of these corbels shows that, however elaborate they may appear, they are generally made up of a series of shallow mouldings, designed with regard to the jointing of the stones, which are always let into the wall square, to give an appearance of strength and to avoid scribing.

The mouldings, when there are many of them, generally fall within one plane. A string course as often as not forms the topmost member and serves to tie the oriel to the wall, as well as to give protection from the weather and prevent rainwater running down and disfiguring the mouldings.

At Hengrave is a particularly rich one, and although the oriel itself, the doorway below, and even the boldly-carved heraldic panels were doubtless conceived and carried out by the native craftsmen, there is little doubt that we have in the figures in the corbelling one of the many instances of the combined handiwork of Italian and native carvers which are found in the first half of the sixteenth century in the South of England.

An even more striking example of this combined handiwork of native and foreign artists is seen in the entrance front of Montacute House, where, set in the midst of a wealth of native workmanship is some sculpture in low relief, in which the hand of the Italian carver is clearly seen in the little figures supporting the diamond panel, set up here in 1786. Ends stop abruptly against return walls instead of terminating with strong angles. It would be easy to multiply examples of fine craftsmanship from houses built in the fifteenth and sixteenth centuries all over England. Many have been pulled down, many have been disfigured by rebuildings and additions, but almost the deadliest foe they have had to contend against has been the ignorant "restorer," who, as often as not, has thrust himself to the fore, and in so doing has dealt a blow at the subtle qualities of the old work from which it can never recover. For this native craftsmanship is elusive in its charm. Seek not to master it by the ponderous study of fancied principles of design, for there is no conscious design in the latter-day sense of the word. Purpose is expressed with sincerity, often with naïvety; there is no sacrifice to the dictates of ymmetry, which have at times been so monumental in their destruction of truthful, unaffected building. If a wing was needed on one side of a house rather than on another it was thrown out; if a bay window was wanted to give importance and better light to a principal apartment, it was fearlessly built without any thought as to the necessity of another one o balance it. No one knew better than the builders of that time how to let it tell its own story and strike its own note in the composition.

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* A lecture delivered at Carpenters' Hall on February 9 by Mr. Arthur Stratton, A.R.I.B.A.

Whether the material used was timber, brick, or stone, each was handled with thought for its peculiar properties, and never was effort made to force it beyond its natural expression. Genuine materials, however homely, were considered preferable under all circumstances to imitative ones, and seldom did it happen that their appearance was not improved by the right methods of working them. In these English homes, large and small, we have conclusive proof that native craftsmanship was equal to the calls made upon it, and only in detail, which formed no essential part of the structure, do we find the Flemish or Italian artist giving evidence of his greater grasp of decorative motifs, and carving in wood or stone, or modelling in terra-cotta heads, arabesques, and even figures such as they were familiar with in their own countries, but for which they found no precedent in this. Never was there a period of building activity in England which owed its vital qualities to restraint, to the right use of material, and to insistence upon simple, straightforward methods of execution more surely than that during which the beautiful houses were erected of which I have been speaking this evening. They were built by men about whom we know practically nothing, whose names even have not been handed down to us except in those few instances where that of a master mason or a master carpenter has been recorded in a building account. The full flood of the Renaissance swept over the land while they were still masters of their own crafts, yet the carrying out of new-fangled ideas and the strange contortions of Classic profiles, for which they were called upon to reject their own unobtrusive art, was destined to rob them of the opportunity to keep alive their own traditions, and even in later years to stand in the way of their receiving the recognition which ought long ago to have been meted out to them. They always worked within their strength; they gave us craftsman's architecture at its best, suited to the climate and to the needs of the people, and if we would throw off many of the trammels which fetter us to-day and express ourselves once more in that healthy, unaffected manner of building which it is our common aim to promote, we cannot do better than look to their handiwork for guidance and inspiration, for in it we shall find made clear many of the secrets of beautiful building.

## ENGLISH MEDIÆVAL FONTS AND MONUMENTS.*

THE variety of design in fonts is most remarkable, and it is almost impossible to do more than roughly classify them according to their architectural periods. It is a subject of very great interest, whether looked at from the architectural or ritual point of view. It is strange, therefore, that it has not, speaking generally, received the attention from antiquaries that it deserves. A remarkable exception to this neglect is afforded by Mr. Bond's recent and very interesting volume on fonts.

As to the existence of fonts of a date previous to the Norman period it is impossible to say much. At times absolutely plain blocks of stone, without any ornament or distinctive carving will be met with, and such examples people are anxious to assign to this early period. There is, however, nothing but the plainness to support this theory, if, indeed, such a characteristic can be considered a sign of antiquity. Fonts there must have been of this early date; what then has become of them? Bede says they were not made of stone. This fact, taken together with the love of the Norman architects for a profusion of surface ornament, and, therefore, their desire to introduce elaborately carved fonts, may account for the almost complete absence of the pre-Norman examples. It may be positively asserted that Norman fonts are very numerous, while earlier examples are but seldom found. The best pre-Norman font, perhaps, is at Potterne, in Wiltshire; it bears an inscription from the 42nd Psalm.

There is a surprising number of Norman fonts to be found in our country churches in very good preservation, notwithstanding their antiquity. These fonts, we must remember, are the work of masons who had to put out their fires at 8 P.M., and remain in darkness until daybreak, who had no surnames, and no means of going from place to place but on foot, or at most on horseback. They are large and massive and reflect, so far, the sombreness of the lives of those who made them. Their cumbersomeness made them not so easy to displace as some of those wrought in succeeding centuries, such as we occasionally find disregarded in out-of-the way places, in gardens or farm-yards, on account of having been supplanted by modern work. They were also richly carved, which may have been another reason why they were preserved through the successive reparations in the churches to which they belong. There was also in many cases some idea of sanctity attaching to a special font, which led to its preservation even when the whole of the church was rebuilt.

As to the position of fonts, there is no doubt that it varied, but within certain limits. They are to be found at the west end of the church, near the west or south-west doorway: and if they are not now there it is pretty good evidence that they have at some time been moved. Of course, such a position near the entrance to the church was to be typical of the fact that Baptism is the sacrament which gives entrance into the Church. From the time of the Reformation onwards, until, say, the beginning of the Anglican Revival there was a strong propensity to tamper with the position of the font, and to use in its stead a common basin. In 1564 it was directed "That the fonte be not removed, nor the curate to baptize in any basons in the parish churches, nor in anye other forme then is alredie prescribed." The eighty-first Canon of 1603 also refers to this matter in the same way; and yet, notwithstanding these efforts, in many cases they were of no avail. An especially interesting extract from the Parish Accounts of St. Martin's, Leicester, bears on the point:—

1645.—"For a basin to be used at baptism—5*s*. For a handard to bear the same—15*s*. For laying the same in marble colour—5*s*."

1651.—"Received of George Smith, for a stone belonging to the font—7*s*."

1661.—"Agreed that the font of stone formerly belonging to the church shall be set up in the ancient place, and that the other now standing near the desk be taken down."

1662.—"Paid Widow Smith, for the font stone, being the price her husband paid for it—7*s*."

But, alas! this ancient font has again been replaced by a modern one.

*Norman Fonts.*—Whatever form these fonts take, whether square or round, they are always of a more or less heavy type. The simplest design is the tub-shaped plain or sculptured either with figures or some form of ornament. The circular form is also seen raised on a shaft, when it loses much of its heavy appearance, as at Coleshill, Warwick. Square fonts without a stem are certainly rare, but the square form mounted on a central shaft with a supporting shaft at each angle is quite characteristic of the time. A remarkable example is at Winchester. It is sculptured with scenes from the life of St. Nicholas of Myra, the patron saint of boys, virgins and sailors. This font has generally been considered a Saxon example; but this is improbable, judging by the bishop's mitre shown. In very early times bishops had no special head-dress; in Anglo-Saxon days the dress of the clergy differed but little from that of the laity. There was, therefore, no particular form of mitre till about the end of the eleventh century, when a crescent-shaped mitre, represented and known as the *corniculata*, was used. The dresses woven are of a Norman character, as also is the building, which is intended, no doubt, to represent the bishop's cathedral. The date probably would be c. 1150. It is one of a series, of which there are about seven or eight, constructed of black marble, and which almost certainly came from Tournai, in Belgium. The others are at East Meon; St. Mary Bourne; St. Michael's, Southampton; Lincoln Cathedral; Thornton Curtis; and St. Mary's, Ipswich. Another type is the cup-shaped font, with or without a stem. Sometimes in our buildings you will find some particular peculiarity in design or arrangement turning up again and again, in certain localities. Perhaps this peculiarity is in nothing more noticeable than in the fonts. To take one instance; in the neighbourhood of Aylesbury fonts of a special type are to be seen, not only at Aylesbury itself, but also at Monks Risborough, Bledlow, Haddenham, and Great Kimble. They are all of the cup form; but the treatment of the base, which we may call of an inverted form, is certainly unusual.

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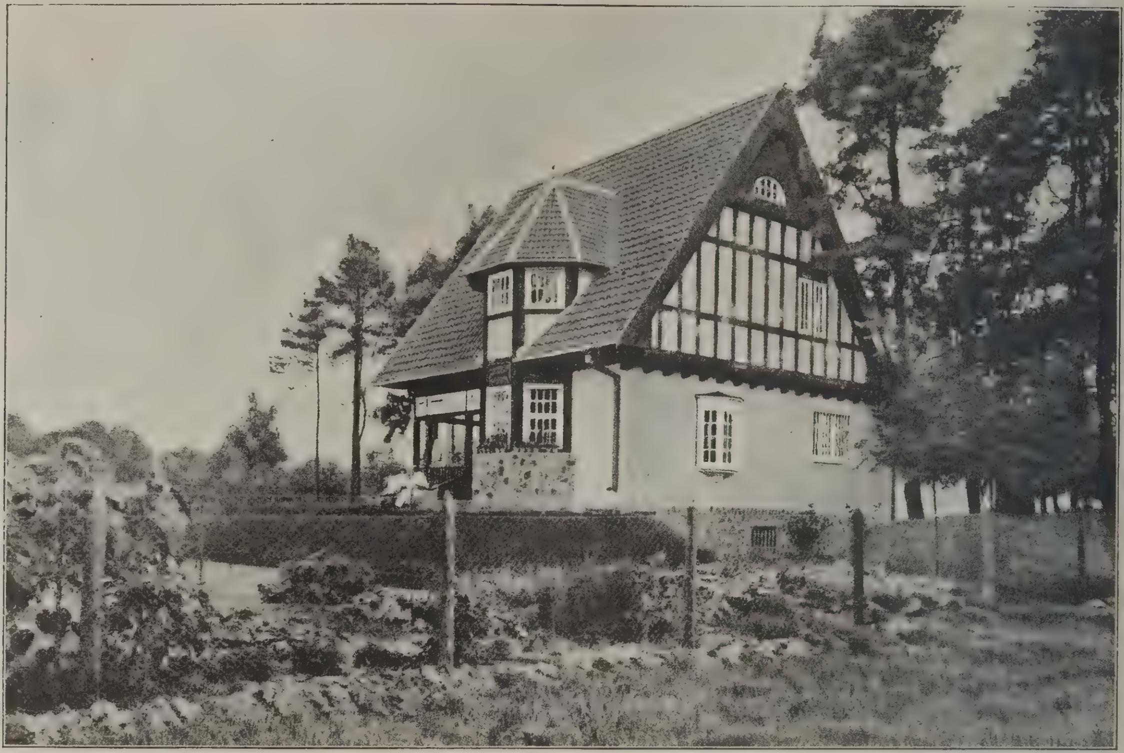
* Abstract of a paper on "English and Mediæval Fonts and Monuments," by the Rev. W. Marshall, M.A., F.S.A., delivered at Carpenters' Hall on Feb. 17.

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Moderne Bauformen*.

SMALL COUNTRY HOUSE AT KUMMERSDORF IN THE MARK.—Ernst Schneckenberg, Architect.

Although the octagonal form was introduced before the end of the Norman style, yet the circular shape was much more frequently used in the Lancet fonts, and they were frequently supported by the central column and surrounding shafts. But the examples are not so very numerous, and it is seldom that any decorative treatment, other than the architectural ornament of the period, is to be seen. Occasionally, as at Barnack, we find the bowl supported upon pierced arches, the effect produced by such arrangement being admirable.

Probably fewer fonts of the Decorated style exist than of any other. We now find for the first time the richly crocketted canopy, the panelled flowing tracery, the ball flower and the diaper background. Examples are at Claypole and Swaton, in Lincolnshire. There is an exuberance of niches and sculptured foliage, and the octagonal stem with slender engaged shafts, the latter now serving only as ornament and not as a support. The octagonal form became all but universal. This is perhaps to be accounted for to some extent by its symbolic meaning; for eight symbolises regeneration. As the number seven is typical of the seven days' creation, so eight symbolises the new creation in Christ, who rose the eighth day from the dead. In this series the seven Sacraments are each given a side, and the Passion is represented on the eighth side.

The practice of raising the fonts on several steps is now frequently seen, although this plan was used before the Perpendicular period. At Walsoken we get a very fine example, and the risers of the steps are richly panelled; sometimes they take the form of a cross, as at Stoke-by-Nayland and Walsingham. This example at Walsingham is the finest font we have in the country; it unites the simple but effective arrangement of risers and the cross form.

Another type was known as the Lion fonts on account of that animal acting as supporters. An example is at Raveningham, in Norfolk. The one at Stafford also has lions, but treated in a different way; it would be hard to surpass the hideousness of this font, its bowl is the shape of four fonts joined together. The one at Fakenham shows heraldry, which is rather uncommon, and the symbols of the Passion. The symbolism was, of course, that the devil goes about like a roaring lion.

Fonts are, almost in all cases, made of stone; there are a few of marble, and also of lead. The example at Dorchester is a fine one of lead, and there are at least two others in its immediate neighbourhood—viz., Wittenham and Warborough. A genuine wooden font scarcely exists. There is one at Dinas Mowddwy, in Wales, and there is also one at Ash, near Aldershot, probably of the fifteenth century. There is an unmistakable fifteenth century example at Marks Tey and another at Stanford-in-the-Vale, Berks.

By a constitution of Edmund, Archbishop of Canterbury, in 1236, it was ordered that the font be decently covered. Hence arose the custom of placing covers on fonts, some of which, like the one at Sudbury, are very magnificent. It is unlikely that there is any cover so old as the constitution of Edmund; the early examples were probably a flat lid. There are beautiful spire-like erections of the fifteenth century at Worstead and Ufford. A very fine example of the best type of Perpendicular is at Sall, in Norfolk; the cover is suspended from a wooden arm coming out of the gallery. Though the ancient fonts do not appear to have been destroyed by the Puritan party, these covers were in many cases demolished. In the churchwardens' accounts at St. Martin's, Leicester, in 1501, appears this entry:—

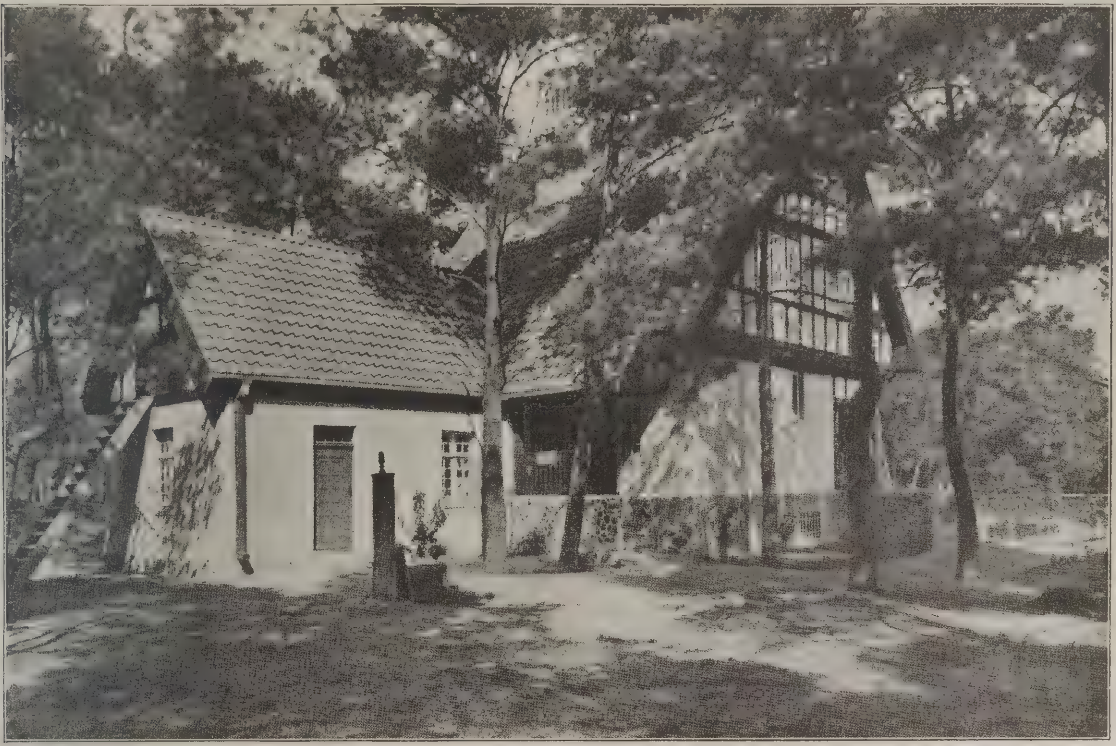
"Payd unto Wylyame Symsome and Robert Craftes for takynge downe ye thynge over the funt XIId."

It is surprising how many of our font-covers are Jacobean—fully more than half of those remaining; nothing more strikingly shows the temporary revival of Church principles during that era. At Walpole St. Peter the cover is fixed on to the font and access is gained to the water by means of two doors. It is in a state of marvellous preservation.

The baldaquin or cover at Trunch, in Norfolk, is a unique feature. It is of very Late Perpendicular and hexagonal, as is also the font, which is inlaid with flint, c. 1350. The supports of the cover are beautifully carved with foliage of a distinctively Renaissance character. The panels were originally painted, and faint traces even now remain of the Crucifixion on one of them. The whole of the work was at one time coloured. The somewhat similar example at St. Peter Mancroft, Norwich, is supported on four pillars, but is almost entirely new work. However, there is another piece of work, something similar on these lines, at Luton; this, of course, is of stone and of the Decorated period. It is a very imposing feature, but more satisfactory in design perhaps than in execution. The roof is a fine groined vault of stone. The height is about 19 feet. At Beckley, near Oxford, there is a bracket placed just near the font, so that when the priest took the child in his hands his book would not topple over the edge of the font into the water.

Of the numerous monumental relics that are preserved in our churches but very few indeed can, with any degree of certainty, be ascribed to a period prior to the Norman Con-

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Moderne Bauformen*.

SMALL COUNTRY HOUSE AT KUMMERSDORF IN THE MARK.—Ernst Schneckenberg, Architect.

quest. Even from thence to the reign of Henry III., *i.e.*, to the end of the twelfth century, the number is comparatively small, notwithstanding the vast increase of monastic buildings.

The origin of monuments is to be found in the fact that they were constructed either to contain the remains of the dead, or to mark the exact spot of their interment. In the primitive age of Christianity, when the presence of a dead body was considered defiling to the House of God, such memorials were necessarily excluded from churches. Burial within the walls of the church arose out of the doctrine of prayer for the dead, because it was thought that worshippers would be better incited to offer such prayers if they were perpetually reminded of the departed by the presence of their tombs. At first intra-mural burial was only granted to distinguished ecclesiastics, to founders and other liberal benefactors of churches. The first recorded instance in England of such burial is that of the great Roman missionary to the Anglo-Saxons, Augustine, who was buried in the church founded by himself just without the walls of Canterbury. He was first interred outside the church, and then, at its completion, his body was removed to the porch in the seventh century. The practice thus begun gradually increased, and from the porch only another step was required for the interment to take place inside the church, where such burials seem at first to have been confined to recesses in the walls of the lower part of the church. Another step was taken when, as a special privilege, tombs were admitted into the choir or chancel; and in 1075 Lanfranc introduced vaults into his cathedral at Canterbury, and even permitted sepulture under the high altar.

After a time additional space was required, and to meet this requirement distinct aisles and chapels were added to churches, being exclusively devoted to this purpose. Not infrequently the altars in such chapels were endowed in perpetuity—or for a limited period—with an annual stipend to ensure the daily services of a priest to chant requiems for the souls of those buried therein. But we must be careful not to call every side-altar in a church a chantry altar, for the reason that many of them were not chantry altars—*i.e.*, altars endowed. A chantry means an endowment and not an altar or a chapel.

In the course of time, therefore, our churches became crowded with tombs; very many of these memorials have perished, but, happily, there are still left to us numerous examples of each successive era, from the Conquest onwards. And not only are these to be looked for in our cathedrals, but frequently some of the most beautiful and most rare types are to be found in some obscure and remote village church, the humble appearance of which would lead the stranger to expect nothing worthy of notice.

Monuments constitute a valuable connecting link between the past and the present; their effigies impart a more correct and vivid idea than the most elaborate description can convey of the various costumes and general appearance of ecclesiastics, military characters, of civilians and ladies, and of children also, in successive generations. The accuracy of detail in these monuments is marvellous; it was the business of the sculptor to make a simple and accurate presentment of the man—to show him to us as he was when alive, and not (as was the case at a later date) to show him in clothes which he never wore. Truth in a tomb was considered imperative. But monuments are especially valuable as contemporaneous records; they not only in many cases confirm the evidence of parish registers, but, what is much more important, they carry back their evidence for centuries before parish registers commenced, in accordance with a mandate issued by Cromwell, as Vicar-General, in 1538, just a year before his death.

*Stone Coffins* (c. 1070-1400).—The earliest monuments in the Norman period consisted merely of the stone coffins in which the bodies were deposited. Sometimes the coffin was sunk into the ground and the lid, forming part of the pavement and ornamented with a cross, or other emblematic devices, was the only part that appeared. Also, the whole coffin may be seen placed above ground, either on the floor of the church or in an arched recess in the wall. The lids to the coffins were generally formed to the size and tapering shape of the coffin itself, and were at times coped or raised to a ridge in the middle, sometimes with the ends treated in the same manner. About the end of the thirteenth century their general form became rectangular.

Stone coffins of the earliest date are without inscription. When inscriptions began to be used they were variously arranged, sometimes on each side of the cross, sometimes above its head and below its base, and sometimes forming a border legend around the verge of the coffin-lid. The cross does not appear to have been generally adopted on monuments till towards the end of the twelfth century; but from this period till towards the age of monumental debasement in this country some modification of the cross was almost invariably placed upon all sepulchral monuments, except when this symbol of the faith was superseded by an effigy of the individual commemorated. From a very early period this cross was floriated and otherwise enriched with various monumental devices. In many examples of this class of monument the cross was accompanied by some emblem of the rank or vocation of the deceased: as a pastoral staff for a bishop, or a sword for a knight. Shields of arms also were occasionally introduced.

The earliest attempt at monumental effigies appears to have been made about the beginning of the twelfth century by representing the person commemorated recumbent on the covering slabs of stone coffins. The figure was rudely sculptured in low relief, the background being sunk in the stone, and the effigy rising no higher than the surrounding margin. But soon a bolder and more elaborate style was acquired, and the effigy executed in higher relief seemed to rise out of the stone till it became a perfect and distinct figure. An example of this type is Bishop Wulfstan's monument at Worcester.

Towards the close of the twelfth century effigies in armour first made their appearance on tombs—*i.e.*, in the reign of Richard I.; and in its main characteristics but little difference is to be found in the two succeeding reigns.

During the earlier part of the thirteenth century the monumental tombs were low, and the sides plain and unornamented; some tombs of this description with effigies appear beneath low arches obtusely pointed and formed within the substance of the church wall, as at Sparsholt and Raveningham. Such tombs have generally been assigned either to the founder of the church or to some early benefactor, or, if the effigy be that of an ecclesiastic, to the first rector or incumbent.

Some remaining specimens of partial effigies are exceedingly curious and evince the fanciful taste of the sculptor or his employer. The sculpture is so contrived as to make it appear as if the head and bust, and sometimes the feet, were disclosed through apertures in the coffin-lid. They first occurred at the end of the thirteenth century. It has been thought that the full length figure was derived from them, but that could not have been so, for the full-length effigy made its appearance years before the existence of these semi-effigial monuments. In the top of a slab at Heckington a quatrefoil is carved framing the head and shoulders of the person represented. At Howell, also in Lincolnshire, there is the same kind of thing, with a second quatrefoil lower down showing a child's head.

It is often found that these semi-figures are combined with the cross, and it may be that this type originated in the desire to effect such a very desirable combination as the cross and the figure of the one commemorated. The brass of Richard de Hakebourne (1310), at Merton College, Oxford, shows this arrangement.

*Altar Tombs* (c. 1200-1600).—In the earlier part of the thirteenth century a new type of monument was introduced, called an altar, or table tomb, which was but an easy transition from the improved character of the stone coffin. These tombs were of oblong shape and stood from two to four feet high. The sides and ends were formed of Gothic panels, ornamented with shields of arms, or other decorations. Before the close of the century niches were added containing representations of saints or angels, or the effigies of the children of the deceased. This form of monument did not by any means always have the effigy. It might be observed in passing that where a dog is introduced at the feet of a female figure it almost always wears a little collar with bells.

Monuments were not invariably made of stone or marble; sometimes we find bronze figures, as in the magnificent example at Warwick of Thomas Beauchamp, Earl of Warwick, who died in 1370. Or, again, they are made of wood, as at Little Horksley. A metallic composition, called latten, was often used about tombs, for inscriptions, instead of being cut in the slab, were generally engraved on narrow plates of this metal sunk into the chamfered edge of the slab, or other parts of the tomb. Garter angels, or other small figures called "weepers," placed around the sides, were also made of this metal.

Soon after the introduction of altar tombs they became strikingly embellished by the addition of canopies; these frequently display the finest architectural taste and most exquisite workmanship, and afford an admirable opportunity for the display of heraldry. They were in three forms:—(*a*) Recessed in the wall; (*b*) placed between piers with their own canopy; and (*c*) placed between piers with the arch of the arcade above used as a canopy. Another type represented in the upper division the deceased in life, full of health, and in the lower an emaciated body or a skeleton. On the tomb in Lincoln Cathedral of Bishop Fleming, who died in 1430, appears his effigy as in life, arrayed in episcopal vestments; whilst in a recess beneath his body is represented in a shroud in a state of decay. Another instance is the fine monument of Alice, Duchess of Suffolk, in Ewelme Church.

In the same fifteenth century another variety of monument makes its appearance; it is made of some hard stone of the Purbeck marble character, but not so liable to crumble; and on account of its hard nature the details of carving are always lacking in depth. It is generally of a somewhat debased character, and evidences are often present of the influence Italian architecture was beginning to have over our national character. Such monuments never have the recumbent effigy; but very frequently brasses are fixed to the back of the monument.

*As to Brasses.*—About the beginning of the thirteenth century incised stone slabs began to be used as memorials, and were laid in the floor, and formed, indeed, part of the pavement. Soon after their introduction they were considerably improved by the devices being engraved on metal plates sunk in the slab, instead of being figured on the stone itself. These brasses exhibit great variety in the character and number of their devices. Some are simple and consist merely of a chalice, a cross, or a host. Others are elaborately executed and profusely ornamented.

The word "Hearse," or "Herse," in the minds of most people, pre-supposes a funeral car with its trappings, in which the bodies of the dead are borne to burial. But its derivation is probably from *hirpex*,* a harrow, as used in agricultural operations. We do not know the exact form of this Roman harrow; but heraldry helps in this matter, for an old English family of the name of Harrow has for its arms three harrows of triangular form. This is the form of a harrow when used in an ecclesiastical sense, when it signifies a triangular frame of wood, suspended from the roof of the church, and at the points where the bars crossed were sockets for candles. These hearses soon gave way to metal candelabra. The next step in the etymology of this interesting word is in connection with the burial ceremonies. The body was placed near the altar, and over the body, which was generally without a coffin, except in cases of persons of distinction, was placed a light framework of wood, on which the pall was placed. At the corners and on the ridge were places for candles. Not a single example of these wooden hearses is known to exist. But occasionally they were copied in metal. A beautiful example is at Tanfield, near Ripon, for one of the Marmions. Another is the tomb at Warwick of Thomas, Earl of Warwick, who died in 1439. This is made of latten, and the contract for its erection, which still exists, speaks of it as a hearse.

The funeral car to which we now give the name of hearse to the exclusion of the older meaning originally differed but little from these stationary hearses, except that they were on wheels and the necessities of locomotion required them to be smaller.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* shows two picturesque rubble-stone small country houses by Messrs. Mellor & Meigs, one of which is curious as an alteration of a stable building to a residence. The series of articles on "The House and its Environment," by Arthur G. Bein, is continued.

*La Construction Moderne* illustrates the model Alsatian house which was one of the features of last year's exhibition at Nancy, and the new premises of the journal *Le Nord Maritime*, at Dunkirk, of which M. Morel is the architect. Our contemporary gives views of the effect of the Seine floods at the Ecole des Beaux-Arts, and apologises for the delay in illustrating the winning design for the Labarre prize at the Ecole, which is now given, on account of the flooding of their photo-engraver's workshops.

*Moderne Bauformen* this month includes some of the work of two English architects, Mr. Charles Wade and Mr. Tom Merry. Most of the remaining illustrations are given up to the work of Messrs. Pfeifer & Grossmann, of Carlsruhe, and Leopold Bauer, of Vienna, all of which is redolent of German national feeling without being too effusively modern.

*Het Huis* has an interesting illustrated article on the layout of a small suburban garden, which, though no scale is given, shows what might be done on a villa site of about 40 feet by 150 feet. An illustrated account is given of the picturesque old buildings of Oudewater, and another of the churches of Warmond, old and new.

*Stone* has a good photograph of the doorway of the Palazzo Pessagno, in the Via Catarina, at Genoa, of which, as noted in our leading article, a measured drawing by Mr. C. Gascoyne appears in the Architectural Association Sketch Book for 1909. There is also in our contemporary a continuation of a good series of articles on cylindrical vaulting.

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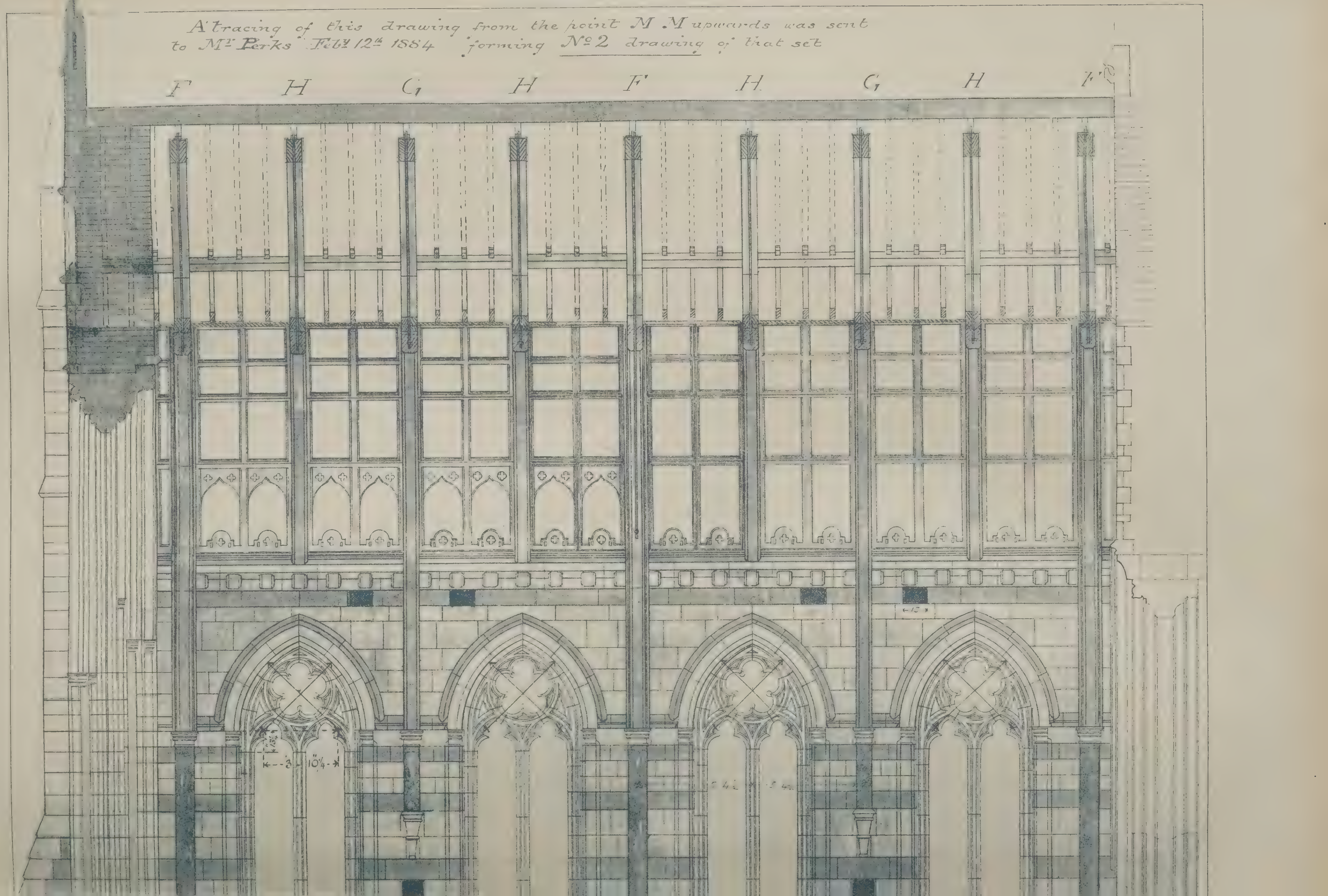
* Probably through the Low Latin form *hercia*.—Ed.



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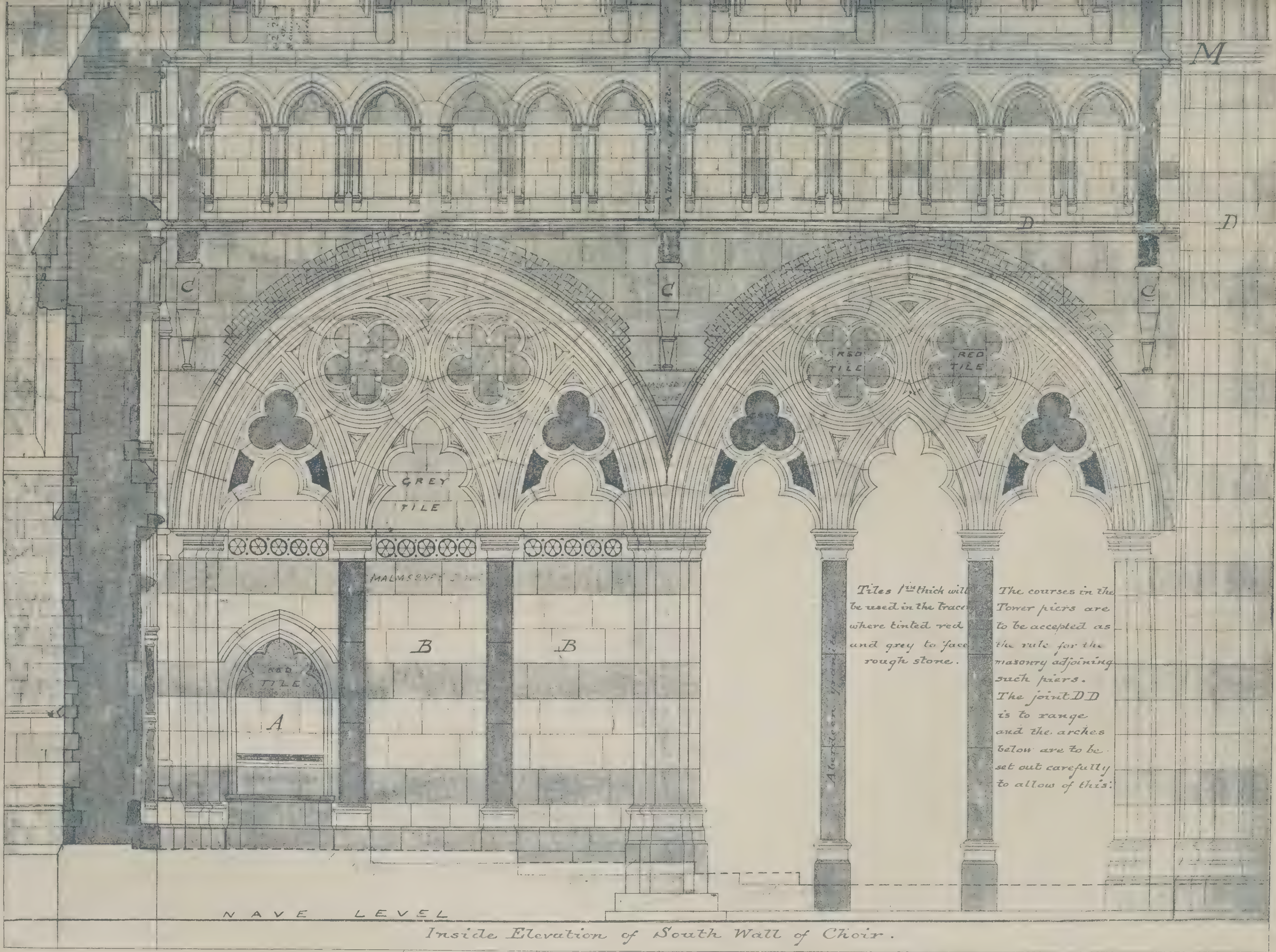
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Aberdeen granite
Tiles 1in thick will be used in the tracery where tinted red and grey to face rough stone.
The courses in the Tower piers are to be accepted as the rule for the masonry adjoining such piers. The joint DD is to range and the arches below are to be set out carefully to allow of this.
NAVE LEVEL
Inside Elevation of South Wall of Choir.

INK-PHOTO SPRAGUE & C° L^D 4 & 5 EAST HARDING STREET FETTER LANE. E.C

ST. PAUL'S CATHEDRAL, MELBOURNE: SECTION OF CHOIR, LOOKING SOUTH.

From a Drawing by the late Mr. WILLIAM BUTTERFIELD.

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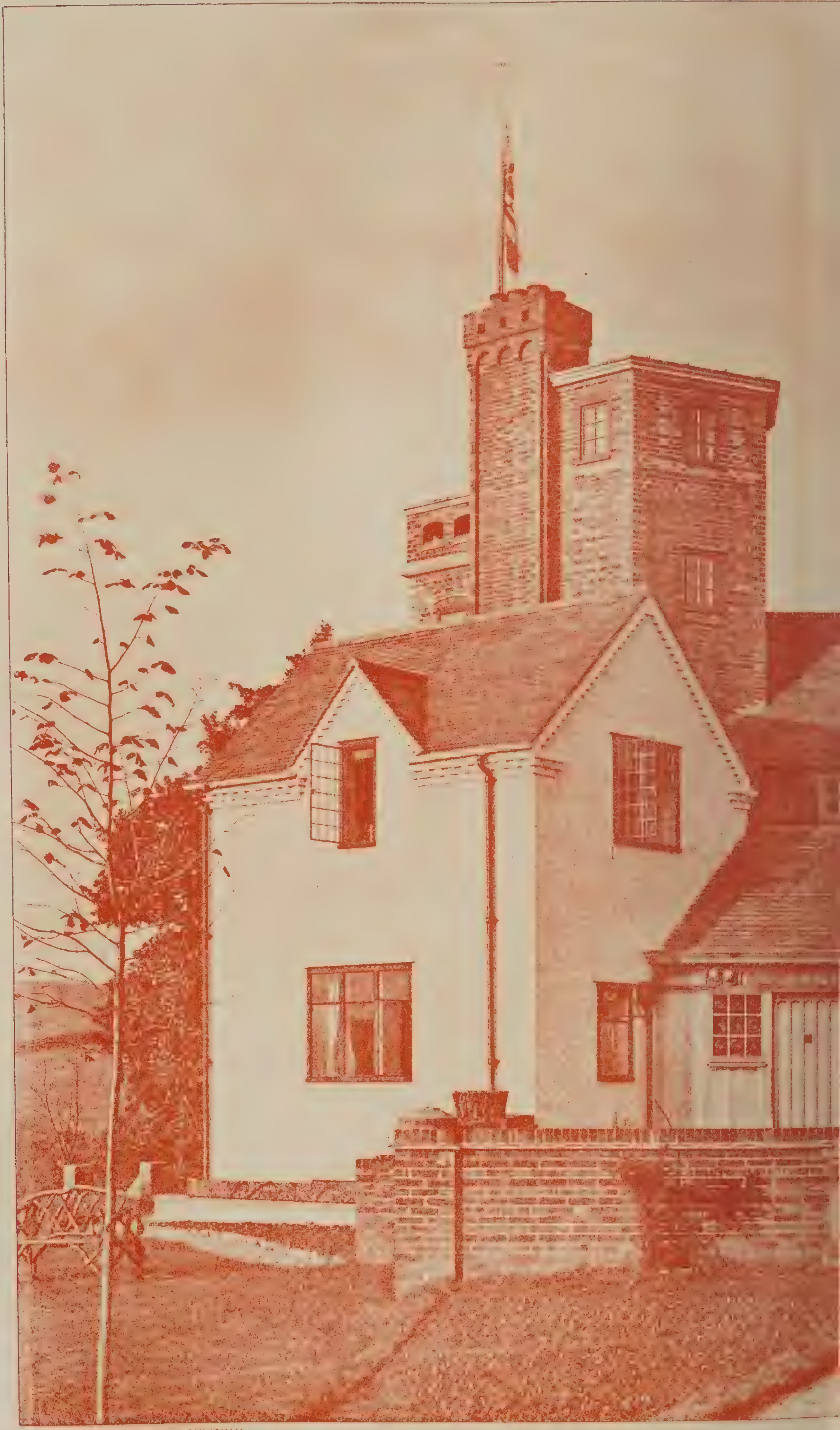
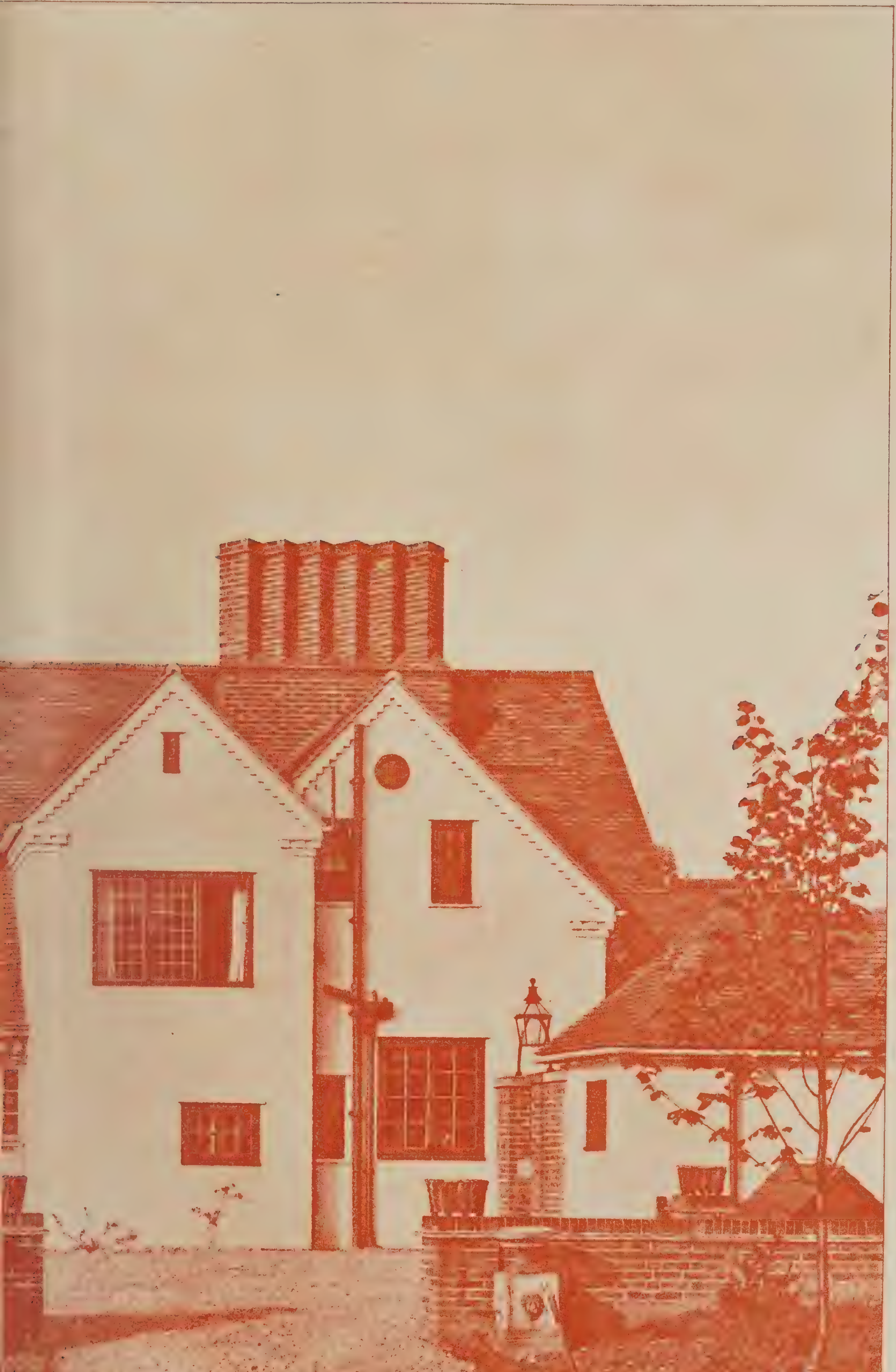


T. LEWIS. PHOTOGRAPHER BIRMINGHAM.

"THE TOW

Mr ARTHUR BARTL



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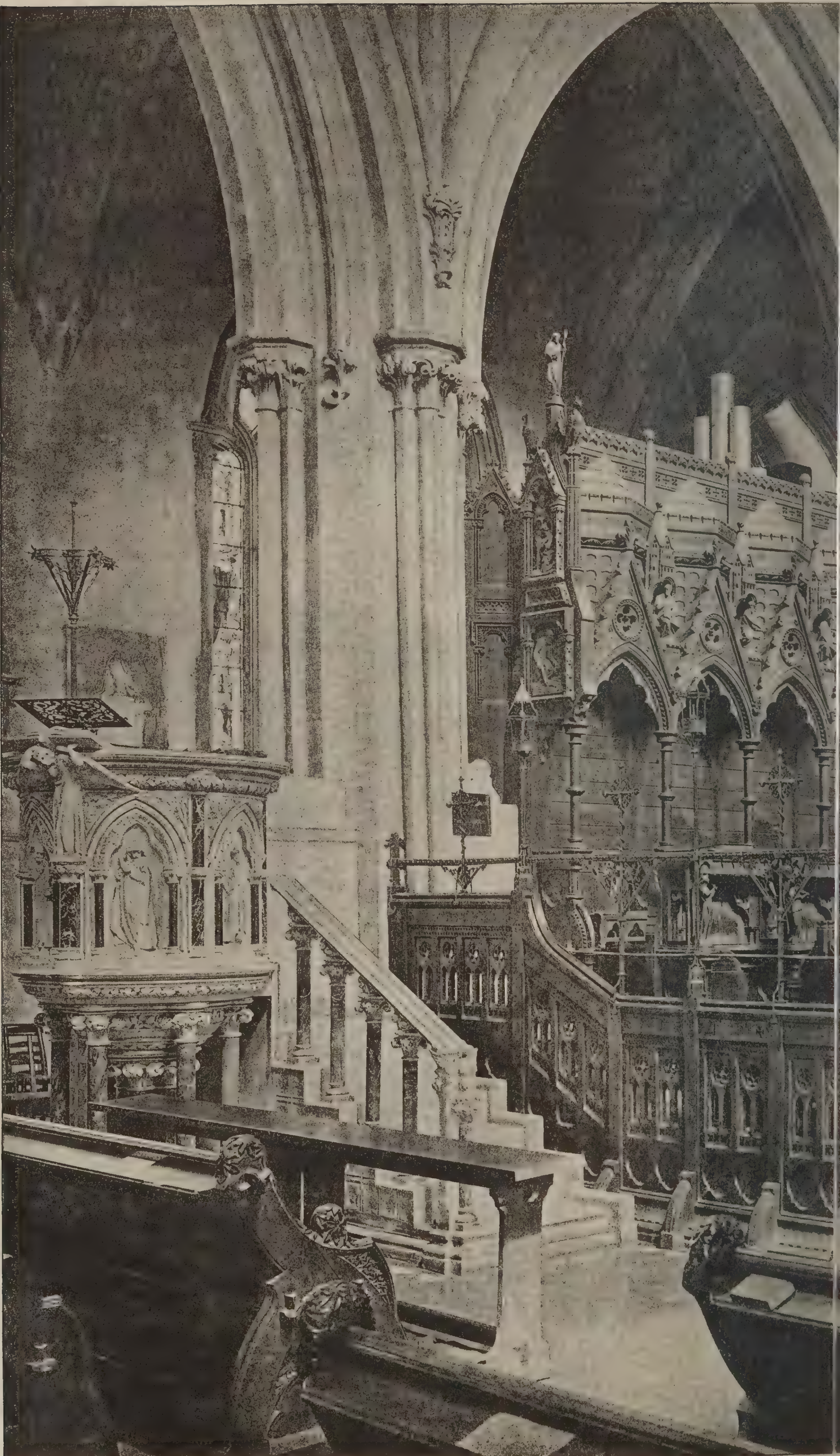
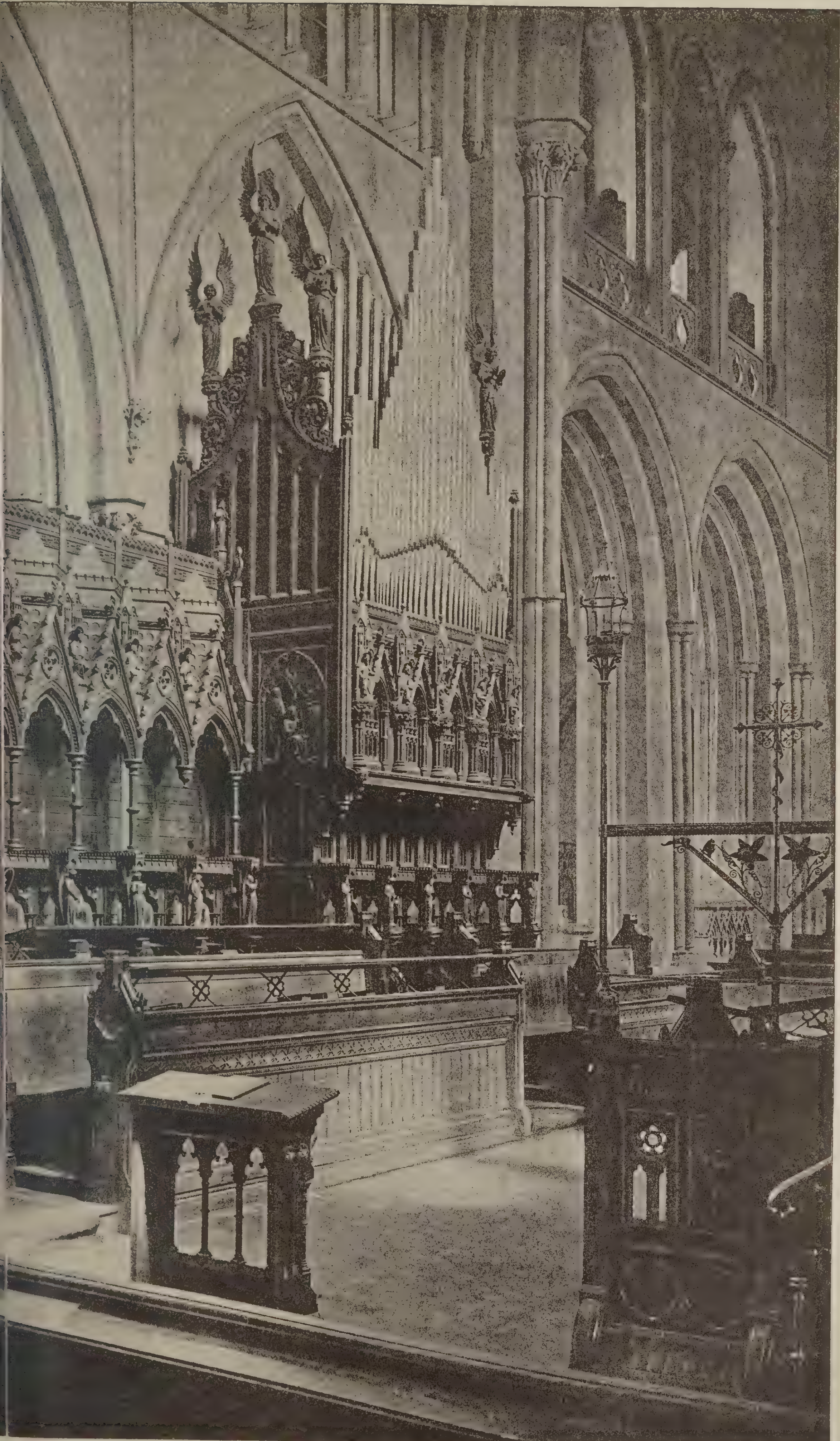
DODFORD.

R.I.B.A., Architect.





INK PHOTO. SPRAGUE & Co. L 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

ADAFF: North Side of Choir.

# The Architect.

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## FORTHCOMING EVENTS.

*Friday, March* 4.

Architectural Association : Paper on "The Mediæval House," by Mr. J. Alfred Gotch, F.R.I.B.A.

*Monday, March* 7.

Royal Society of Arts : Cantor Lecture I., on "Lead Work," by Mr. Lawrence Weaver, F.S.A.

Liverpool Architectural Society : Paper on "Some Lessons from America," by Professor C. H. Reilly, M.A., A.R.I.B.A.

*Tuesday, March* 8.

Architects' Benevolent Society : Annual Meeting at 9 Conduit Street at 5 p.m.

Manchester Building Trades Exhibition, City Exhibition Hall, Deansgate, March 8-19.

*Wednesday, March* 9.

Carpenters' Company : Paper on "The Use of Coloured Materials in Building," by Mr. Halsey Ricardo, F.R.I.B.A.

Edinburgh Architectural Association : Paper on "Decoration," by Professor W. E. F. Britten.

*Thursday, March* 10.

Society of Architects : Paper to be read.

Royal Institution : Paper on "Turner," by Mr. A. J. Finberg.

Carpenters' Hall : Paper on "Japanese Decorative Art," by Mr. W. Harding Smith, R.B.A.

## CONDITIONS OF ARCHITECTURAL COMPETITIONS.

There can be no doubt that at present the conditions under which the profession of architects is expected by promoters to compete for the privilege of carrying out buildings are decidedly unsatisfactory.

Although great progress in the direction of securing freedom from grossly unfair decisions has been made through the employment of professional assessors, a method now generally recognised as essential in public or open competitions, there yet remains considerable room for improvement even in this direction.

Much dissatisfaction and friction have been occasioned in competitions in the recent as well as in the more remote past by a disposition on the part of assessors to disregard some or other of the conditions or instructions issued to competitors. Technically, assessors appointed by the President of the Royal Institute may be considered bound to exclude designs only if they come within the scope of the grounds of disqualification stated in the regulations approved by the Royal Institute. In these the disqualification by reason of excessive cost is very elastically defined, and the assessor is only presumed to disqualify if the outlay stated in the instructions is adequate. That is, in nine cases out of ten, the assessor is, by the Institute regulations, free to disregard the limit of outlay so long as he takes the question of cost to "be a material element in the consideration of the award," which, of course, means anything or nothing.

That a design should be excluded from a competition "if any of the other instructions are violated" is a so-called "regulation" which has too often by assessors been regarded as a "recommendation" or "suggestion," with the result, as we all remember, of much bitterness and exasperation.

There is a very general feeling, and, we think, rightly, that the particulars supplied by promoters to competitors should differentiate between "conditions" with which compliance is essential and "suggestions" as to which competitors are free to use their own judgment. The category in which the amount of the outlay is to be included in each instance ought to be quite clearly and emphatically stated.

We think that assessors have been very much to blame for the growth of the burden that architects who take part in competitions have now come to feel is intolerable—the excessive costliness and wastefulness of our present system. Over and over again the deplorable result has been seen that the value, nay, even the out-of-pocket cost, of the competition drawings has exceeded the gross amount of the successful architect's remuneration. Take the still undecided competition for the National Museum of Wales. How many of the competitors would, in the ordinary way of business, have been satisfied to prepare their designs for a fee of 100*l.*? Yet even at this low figure the value of the 129 designs is 12,900*l.*, and the gross amount of the winner's commission will be 12,500*l.*, for which he will have to wait years and years, as the promoters only propose to build one-third of the whole building for a start and seem to be very dubious as to where the remaining two-thirds of the cost is to come from.

It appears to us that the most costly competitions in which an architect can take part are those in which an assessor has assisted to draw up the instructions and conditions. Complete plans, sections, and elevations to one-eighth scale are not sufficient for these officials. They must have block plans showing the drains, &c., generally to so small a scale that it is impossible to draw all the pipes and manholes; they must have half-inch scale details "of a portion of the principal front," because they cannot, or will not try to tell from an eighth-scale drawing whether an architect knows the grammar of his art; they must have perspectives, because they cannot, or will not try to grasp the composition of a building from plans, section, and elevations; they must have the shadows correctly projected according to the rules of sciography, because they cannot, or will not try to read plan and elevation together. All these recently-added requirements are pure fads which, to our mind, seem to indicate that assessors are prone to save themselves trouble at the cost of considerable unnecessary expense to the competitors.

No wonder there is a revolt against such a state of affairs, for the remedy of which the best suggestions that have been made are, we consider, those of Messrs. Leeming and Mr. E. M. Gibbs.

In our opinion, any assessor who is worth his salt ought to be able to select from a hundred or a thousand schemes the dozen or half-dozen that give the best promise of a successful design, with no further drawings than might be included on three sheets of quarter-imperial paper and comprising sketch plans of the two principal floors and a freehand drawing of an outline perspective. As Messrs. Leeming have pointed out, a large number of competitors in every competition go wrong at the start, and every hour spent in the elaboration of a wrong idea is absolutely wasted. The Cardiff competition is an illustration in point. It took the assessors quite a comparatively short time to discard all the designs but twelve. Numbers of designs were at once out of the running because their authors had placed the reserve collections in the wrong position or committed some other equally hopeless error of judgment in their original conception. The simplest of sketches would have been equally lucid in revealing such errors to the assessors as the costly sets of drawings that have been the fruit of completely abortive effort.

When the assessors have selected the half-dozen, dozen, or score, as the occasion may determine, of likely schemes, then the authors of these should be invited to work out their schemes and should be paid for their out-of-pocket expenses on some such scale as Mr. Gibbs has proposed.

Another improvement that might well be pressed is an approximation to an enhanced scale of premiums as is now the usual custom in Germany. It is no uncommon thing for a sum of from 2½ to 5 per cent. on the proposed cost of the building to be placed at the disposal of the jury for the reward of meritorious designs in addition to the usual first, second, and third premiums. We believe the British public would follow the same course if they were told by the Royal Institute that they ought to do so.

A class of competition that is very much on the increase is the private limited competition. Private individuals, but more often firms or directors of public companies, committees of chapels and churches, &c., invite a limited number of architects to compete. Not infrequently the competition is a bogus one and is meant only to cover nepotism on the part of those who are in a fiduciary position.

It seems very desirable therefore that the Royal Institute, whilst engaged in the revision of its Regulations for Architectural Competitions, should take this matter into account and insist that for its members such competitions should connote the appointment of an assessor and the adequate payment of all the competitors. It is all very well to say that private individuals or the heads of a firm of manufacturers know what they want. There would be no objection to a representative of the promoters being associated with a professional assessor, but some steps ought to be taken to prevent, as now happens, members of the Institute being virtually forced, at the risk of offending friends or clients, to take part in competitions which are simply window-dressing to cover the appointment of the son or nephew of the chairman or managing director. We understand that there have recently been one or two flagrant instances in Manchester where members of the Institute have been forced to send in competition drawings with the full knowledge, or at least expectation, that they would not receive fair play. Such an experience might be avoided if members of the Institute could say that under the Regulations they must decline to compete unless an assessor was appointed and competitors were paid for their labour.

Such a provision in the Regulations would also tend to prevent the application to architects of a system that is not infrequent in commercial circles. Tenders are invited from a number of firms, and then these are put before others in order to obtain a better quotation. So, on commercial lines, designs are invited from a limited number of architects, and then others are asked to submit something better and more in accord with the fancy of the promoters.

We are confident that the Royal Institute, in the revision of its Regulations, has only to tell the public what are considered by architects to be fair terms, and these will be accepted.

## NOTES AND COMMENTS.

In selecting Mr. Thomas Graham Jackson, R.A., as the nominee of the Royal Institute of British Architects for the Royal Gold Medal this year by reason of his works as an architect the Council have certainly sufficient justification for their recommendation. Mr. Jackson has carried out a large number of interesting works as an architect, works expressing individuality and, within reasonable limits, originality. As a general rule, Mr. Jackson may be said to have founded his designs almost exclusively upon English architecture prior to the eighteenth century, and there is, in our opinion, no living English architect who has so thoroughly imbibed the spirit of the best work of our national art of the sixteenth and seventeenth centuries. If we were Buddhist, we should regard Mr. Jackson as the re-incarnation of the man who designed the west front of Winchester Cathedral, and to no one could its restoration or repair be in our time more happily entrusted. The characteristics of Mr. Jackson's work as an architect appear to us to be those of the prototypes on which it is founded. It is picturesque and piquant, but lacking in a fine perception of proportion.

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Mr. Thackeray Turner, secretary of the Society for the Protection of Ancient Buildings, has been writing to the *Times* anent two south-country buildings of interest. He informs the public that Cowdray House, or rather its ruins, having become the property of Sir Weetman Pearson, the new owner has taken steps, approved by Mr. Turner, for the preservation of the ruins. The other building about which Mr. Turner writes is Puddletown Church, Dorset. Here the Society is acting more in accordance with its traditional character, and protests against the extension eastward of the chancel and north aisle, notwithstanding that it is admitted that the chancel was at one time longer. The church seems to have been "elaborately refitted about the middle of the seventeenth century." The objection of the Society is that "if the proposed enlargement were carried out there would be an ugly scar of new work both inside and outside the building." We are not told by Mr. Turner who were the vandals that reduced the chancel to its present length, or when it was done, but we might be pardoned for presuming that it was "about the middle of the seventeenth century," when the elaborate refitment was carried out, and possibly the vandalism was the result of a desire to remove the sedilia, piscina, and other traces of the devotion of the original builders, or to lessen the cost of the elaborate seventeenth century work, either of which, in our opinion, was an unworthy motive, and in no way deserving of respect. If the seventeenth century men committed outrages to please themselves, why should we of the twentieth century refrain from undoing their iniquities and restoring the chancel of a church to the dimensions that we, as well as the original builders, consider more fit for the due performance of Divine worship? Of course, this is rank heresy to the Anti-Scrape Society, whose principles and tenets are opposed to the practice of artists of all ages prior to the latter part of the nineteenth century.

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The lesson that Mr. John Nisbet sought to teach in a recent lecture on "Picturesque Streets" to the Philosophical Society of Glasgow, that modern streets might be, and are, picturesque, is one of which ample illustration is to be found in Glasgow, as the lecturer pointed out in his reference to George Street, St. Vincent Place and St. Vincent Street looking west, Sauchiehall Street looking east from Charing Cross, Trongate looking east from a point near Glassford Street, Great Western Road and Kelvin Bridge from a point in Rosebery Terrace, and Buchanan Street looking southwards from a line above West George Street. Mr. Nisbet, in the course of his lecture, showed that although the traditional acceptance of what was picturesque adhered largely to the ancient town with the irregular thoroughfare, overhanging gable, warping roof, and the quaint construction probably enhanced by the infirmities of time, full sympathy with the traditional was not to be despised, but an extension of our admiration to include the modern was profitable, as the ancient was not always available. Most frequently the picturesque street owed its beauty to buildings of quality in design, but it was evident that few streets were wholly good in architecture, and the faults of detail might be softened by atmosphere or distance. The principles regulating a picturesque street were a good sky line occasioned by the varying heights of ridges, chimneys, and such features as dome, tower, and spire, the variation of tone due to colour of material, and minor details such as projections, recesses and openings.

Drawn by Leslie Wilkinson, A.R.I.B.A.

Bristol is exercised over the future of the three paintings by Hogarth which were purchased of the artist in 1756 by the Vestry of St. Mary Redcliff, and for which he was paid 525*l.* "in full of all demands." The pictures remained in the church for a century, and were then purchased for the Fine Arts Academy, where they now are. But the Academy wants to get rid of them and proposes selling. Why not restore them again to their original home?

The severity of unemployment at present existing in the building trade is illustrated by a request received by the Edinburgh and District Trades Council from the Edinburgh and Leith District Joiners' United Trades Committee. The committee propose a reduction of working hours in the building trades from fifty-one to forty-four per week, as the most effective palliative for unemployment. This, of course, is one way, but a more effective, failing for the present Tariff Reform, would be a general reduction of wages, so that Great Britain may be able to compete on more equal terms with those competing countries in which Protection obtains. Reduction of output may be a palliative for unemployment in the building trade, but it is not a remedy for the loss of business that the nation sustains through the operation of more favourable conditions under which foreign countries produce. The reason why we are being beaten under the existing conditions of Free Trade is that foreigners can find a market here for their surplus production, and as increase of production lessens its cost in manufacturing industries, the foreigner can produce more cheaply than ourselves because we are kind enough to take his surplus.

Recent allusion in the Press to the repair of the Hampton Court clock recalls the fact that the maker of it was Nicholas Oursian, appointed clockmaker to Queen Mary and Elizabeth, whose initials, "N. O.," are visible inside the dial. Nicholas Oursian was one of the many skilled craftsmen who came from France and the Netherlands, to whom grants of "denization" were made to enable them to exercise their calling. We can trace in many English homes the influence of foreign artisans who were much employed here during the Tudor period of building and decorative design. On this subject a valuable paper by the late Sir Digby Wyatt was contributed to the *Journal of the Royal Institute of British Architects* in 1869. The Hampton Court clock consists of three revolving discs, with a long pointer which tells the hour of the day, the day of the month, the month of the year, the phase of the moon, and the time of high water at London Bridge. The "Clock Court" at Hampton Palace was so called from the position of this astronomical clock in that quadrangle. This old clock was taken down in William IV.'s reign, but was replaced, and now, according to the daily Press, has been thoroughly repaired. Other examples of foreign workmanship in this royal Palace are Tijou's beautiful iron screens, which have been restored to their original position in the Privy Gardens. The Palace is indeed famous, and still continues to maintain its world-wide interest in history and architecture.

In connection with the question of the exemption of the London County Council's school buildings from the provisions of Parts VI. and VII. of the London Building Act, 1894, a summons was recently issued by the district surveyor against Messrs. Galbraith Bros., the contractors for the erection of the "John Ruskin" school for physically and mentally defective children (Newington), to enforce payment of fees under the Act in respect of that school. As a result, the magistrate decided that school buildings were exempt from the provisions of Parts VI. and VII. of the Act, but that, notwithstanding this, the district surveyor was entitled to his full fees in respect of such buildings. As the district surveyors propose to continue to treat the Council's school buildings as not exempt from the provisions of Parts VI. and VII., the Education Committee are of opinion that an endeavour should be made to obtain an express decision on this question. They therefore suggest that the solicitor should proceed with the application which has been served on the magistrate to state a case for the opinion of the High Court, and in the event of the case not being stated in a form likely to lead to a decision on the point, the committee will report further.

## CONCOURS INTERNATIONAL D'ARCHITECTURE, PARIS, 1910.

I.—Le concours a pour objet d'élaborer les plans d'une

*OLYMPIE MODERNE*

comprenant :

1° Les édifices, portiques, arènes, pistes, etc. . . . propres aux épreuves de sport et d'art inscrites au programme des Jeux Olympiques modernes ;[1]

2° Les aménagements servant aux spectateurs ;

3° Les édifices ou espaces nécessaires pour les cérémonies connexes aux Jeux ;

4° Les installations affectées à l'administration, aux athlètes, etc.

Les concurrents auront aussi à déterminer les particularités topographiques du site choisi ou imaginé par eux.

II.—Les concurrents devront envoyer au minimum *quatre*, au maximum *six* cartons susceptibles d'occuper un espace d'ensemble de *deux mètres cinquante de long sur quatre mètres de haut*. L'un de ces cartons devra figurer un plan général de la Cité. Les concurrents pourront y joindre un mémoire explicatif qui ne devra pas excéder quatre mille mots.

III.—Tous les concurrents recevront un *Diplôme commémoratif* ; leurs envois seront exposés au public et feront l'objet d'un *Rapport général* sur les résultats du Congrès ; ce rapport contiendra la liste des concurrents. La *médaille olympique*, qui n'a été décernée que 17 fois depuis 1894, sera en outre attribuée au vainqueur du concours. Le jugement sera rendu par un jury composé de compétences internationales au nombre de cinq et représentant les différents points de vue : art, technique et sport.

IV.—Les concurrents sont priés de se faire inscrire autant que possible avant le 1er Mai 1910. La liste des concurrents sera close le *1er Octobre* et leurs envois devront parvenir *avant le 15 Novembre 1910* à M. Gaston Trélat, Directeur de l'Ecole spéciale d'Architecture, Commissaire général du Concours, 254, boulevard Raspail, *Paris*, à qui on est prié d'adresser toutes les communications relatives au concours.

## COMPETITION FOR OFFICES FOR RENFREW PARISH COUNCIL.

The conditions of this competition are, in our opinion, decidedly unsatisfactory. A deposit of ten shillings is required for them, which is only returnable to competitors who submit a *bona-fide* design.

No assessor is mentioned, save that "the estimates submitted by the competitors will be reported on by the measurers appointed by the Council."

Architects competing are required to state distinctly the rate of commission they are "prepared to accept for the complete job."

Designs submitted are not returnable to the competitors.

The accommodation required includes board-room for Parish Council, to accommodate twenty-three and reporters, committee-room, offices for inspector, registrar, collector, and sanitary inspector, waiting-room for poor, strong rooms and stationery stores, lavatories, and cloakrooms, outbuilding for lamplighting stock, covered shed for scavenging barrows, &c. No indication of sizes is given except for board-room.

The site plan gives no information as to levels, sewers, water, or gas supply.

"Such plans, elevations, and sections as are necessary" are to be supplied to one-eighth scale and details "may be also submitted" to one-quarter scale.

The cost is limited to 1,400*l*. inclusive of architect's and measurer's fees, and plans have to be sent in on or before March 21.

## THE WORKMEN'S COMPENSATION ACT AND THE EMPLOYMENT OF INFANT LABOURERS.

By W. S. Holdsworth, D.C.L.

The case of Evans *v.* Vickers, Sons & Maxim, Ltd., decided by the Court of Appeal on the 8th of last month and reported in a recent number of the *Times Law Reports*, would seem to show that it is dangerous to employ infants, who are out of work, as ordinary labourers if, in fact, the infant has been apprenticed to a specific trade. In this case the facts were as follows. The applicant, aged about twenty, applied in July 1907 to the respondents for work as a labourer, and was taken on by them in that capacity at 22*s*. a week. By trade he was a stove-grate fitter. He intended to return to this trade when the prospects of work improved. While in the employ of the respondents he met with an accident, and was awarded compensation at the rate of 11*s.* 4*d.* a week. Subsequently he partially recovered, and light work was found for him at his original wage. The compensation was thereupon reduced by agreement to 1*d.* per week. In August 1909, after he attained twenty-one, he applied to the Court under the proviso to Section 16 of Schedule 1 of the Act, for a review of this agreement. The words of the proviso on which he relied run as follows:—"When the workman was at the date of the accident under twenty-one years of age, and the review takes place more than twelve months after the accident, the amount of the weekly payment may be increased to any amount not exceeding fifty per cent. of the weekly sum which the workman would probably have been earning at the date of the review if he had remained uninjured, but not in any case exceeding one pound." His contention was that if he had not been injured by the accident he would have returned to his trade of stove-grate fitter, and that in that case he would have been earning some 30*s.* a week. It followed, therefore, that the employers were liable to pay compensation on this basis, and not on the basis of 22*s.* a week. The County Court and the Court of Appeal (Cozens-Hardy, M.R., and Fletcher Moulton, L.J.) have upheld this contention. Buckley, L.J., on the other hand, dissented. In his opinion the words of the proviso must be taken to refer to the money which the workman would have been earning if he had continued uninjured in the service of the same employer. It appears to us that there is much to be said in favour of Lord Justice Buckley's view. If the other view is adopted it introduces a highly speculative element into the principle upon which compensation is assessed. Taking this case as an instance, how do we know that this person would have got employment at his trade of a stove-grate fitter? Have we any right to assume that he would succeed in getting such a job when he had failed to do so two years before? In fact, we might say that his chances of a job were possibly less, because he had ceased to practise his trade, and for that reason had become less efficient during his employment as a labourer. It would seem very odd that the Legislature should have intended the Court to embark upon these hazardous conjectures as to a man's chances of employment in a particular trade in order to see what he "would probably have been earning." If, however, Lord Justice Buckley's view be adopted, no such speculative element is introduced. If an infant is taken on in any given capacity, *e.g.* as a labourer, or a fitter of some kind, it is perfectly easy to say what wages he would probably be earning with that master and in that capacity if he had remained uninjured. We think, therefore, that the proviso to this section of the Schedule should be limited in two ways if it is to work with any degree of certainty. In the first place it must be taken to refer to earnings with the same master. In the second place it must be taken to refer to earnings in the same capacity as that in which the workman was employed by that master. The interpretation adopted by the Court of Appeal appears to us to require the Court to make a series of conjectures as to probable future events which could only be made with any approach to certainty by a first-class major prophet. Moreover, it is more than likely that it may inflict considerable hardship upon youthful mechanics out of a job. Masters will naturally be rather chary of giving a job as labourer to one of these persons if they are to be landed with the obligation of paying to such a person compensation at the rate, not of an unskilled but of a skilled workman, because the Court thinks it likely that, but for the accident, the person would have got employment as a skilled workman. The obligations of masters to their employés under this Act are already sufficiently onerous. They will be rendered still more onerous in the case of employés who are infants if this decision stands, because they will be entirely uncertain in amount. They will depend upon the Court's view of what might have been the history and prospects of the infant in a trade he was not actively pursuing if the accident had not happened. It is almost inconceivable that the Legislature should have required any set of human beings to embark upon such an inquiry.

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[1] Consulter la *Revue Olympique* de décembre 1909.

## TOWN PLANNING CONFERENCE.

Under the auspices of the National Housing and Town Planning Council a conference was held on Friday of last week to consider various technical points in the administration of the town-planning powers of the Housing and Town Planning Act. The members attending consisted chiefly of municipal councillors and borough officials, together with a few architects.

Mr. Harold Shawcross, C.C., J.P. (Rochdale), the chairman, in opening the proceedings explained that this conference of borough engineers and surveyors, together with the chairmen of committees, had been called because it was thought that as they would have most to do with the Act it would be best if they could thrash out their difficulties. The Council had expected to have been able to consider the regulations to be issued by the Local Government Board, but these were not ready yet for publication. It was becoming every day more clear that the question of town planning was bristling with difficulties and that the Act would have to be considered very carefully. If the regulations were framed hastily, and proved unworkable, it would cause a great deal of trouble and would set back town-planning schemes in the near future. Judging by the difficulties that had already befallen those who had attempted to prepare town-planning schemes, it would seem that the question would be largely one of making roads for convenience and better access from one place to another. It would, he believed, be found very often impossible and unfair to make landowners bear the cost of roads they did not want. Consequently the cost of making such roads would have to be very carefully gone into. There would undoubtedly be a difficulty in getting a scheme through which was objected to on that score. Then there was the question of the respective contributions to be paid by two authorities for a road made through their areas at widely differing costs.

Mr. Henry R. Aldridge, secretary, then read a letter from the Local Government Board, in which it was said that the President could not yet state what the procedure regulations of the Board would be under Section 56 of the Housing, Town Planning, &c., Act, 1909, as they were still in course of preparation. Mr. Aldridge thought that this unreadiness was not altogether surprising in view of the many difficulties that had been placed before the Board as a result of their conference in December last. The Secretary then proceeded to deal with his memorandum on the cost to local authorities of (*a*) preparing a town plan; (*b*) the carrying of a town-planning scheme into effect. This memorandum has just been prepared by Mr. Aldridge as the fruit of his last visit to Germany, where he was in consultation with the leading town-planning experts, and it thus represents the result of actual experience. The memorandum was as follows:—

### (A) The Technical Cost of Preparing a Town Plan.

### 1. *The Scale Necessary for the Survey Maps.*

The estimate of the scale necessary varies from that of 1 to 500 to 1 to 2,000. City Surveyor Geusen is of the opinion that for very difficult areas the scale of 1 to 500 should be used. For general purposes 1 to 1,000 will suffice, whilst in some cases 1 to 2,000 will be sufficient.

Note.—Ordnance survey maps of the scale of 1 to 500 are already in existence for most of the towns of Great Britain. A list of owners and the areas of the land in their ownership will of course be necessary for the later stage of town-planning work.

### 2. *The Value and Cost of Contour Models.*

There is much divergence of opinion as to the value of contour models. On the one hand it is pointed out that these models have no real value to the skilled men entrusted with technical work in the preparation of the plan, for the maps recording the survey give all that they need. On the other hand it is urged that, although such models are not essential to the technical work of town officials and skilled advisers, yet they are of great service to town councillors in enabling them to form a good judgment both as to the character of the town-planning problem of their town, and the merits of the plans submitted to them.

*Cost.*—The range of cost of a good contour model is from 50*l.* to 200*l.* (1,000 to 4,000 marks). The price, of course, varies with the extent of the area to be modelled and the scale.

### 3. *The Cost of Equipping a Municipal Town-planning Department.*

City Surveyor Geusen, of Düsseldorf, estimates that to produce a town plan within a period of a year would require the following staff in addition to the town official, who would give part of his time to the work, and overlook it:—Expert adviser, three draughtsmen, and two outdoor men.

This estimate is for a town of the size of Düsseldorf (280,000 population), and applies to the land likely to be used for building purposes during the next thirty years, and to town extension work only, and not the replanning of the existing town.

### 4. *The Cost of a Town Plan when an Outside Professional Expert is Entrusted with the Whole Work.*

Professor Goecke (editor of *Der Stadtsbau*, Berlin, and one of the best authorities in Germany) states that a fair standard of remuneration for an outside professional expert undertaking the complete work, from first to last, of preparing a town plan is twenty marks per hectare of land dealt with in the plan. As a hectare is 2.471 acres, this means a cost of about 8*s.* per acre.

### 5. *The Cost of a "General Idea" Plan.*

There is a strong opinion in Germany in favour of limiting the help given by professional town planners and experts to the preparation of a "general idea" plan, leaving the task of completing the plan in detail to the municipal officials. Professor Goecke is strongly of opinion that this is the best course to adopt. Such a "general idea" plan gives the main lines of development, but does not plan every street.

The fair standard of remuneration in Germany for the preparation of a "general idea" plan is five to six marks (5*s.* to 6*s.*) per hectare dealt with in the town extension plan, say from 2*s.* to 2*s.* 6*d.* per acre. In any case the stage of preparing a "general idea" plan must be passed through, and Professor Goecke points out that once a good general idea plan has been adopted the detailed work of more closely planning special areas can be accomplished without the aid of outside experts.

Note.—The statements of cost given above apply to Germany only. No attempt has been made to compare the scale of remuneration for professional services in Germany with the scale in this country for similar services.

## (B) The Cost of Carrying a Town-planning Scheme into Effect.

### 1. *The Distinction between a Town Extension Plan and a Town Plan Dealing with both the Existing Town and the Future Extensions of the Town.*

It is essential that a clear distinction should be made between the scope of town-planning legislation in Great Britain and Germany respectively. In Germany a town plan can be made to secure both the replanning of areas already built upon, and the planning of all new extensions of the town. In Great Britain the power to replan areas already built upon is not given in the Housing and Town Planning Act, and therefore the action which our local authorities may take is limited to the work of town extension planning.

In considering questions of cost of town planning administration this fact is of vital importance. It will at once be recognised that the heavy burdens of cost involved in the purchase of existing buildings and land for replanning at congested centres will form by far the greater part of the cost of German town planning work.

### 2. *The Conditions Governing the Cost of Carrying Schemes into Effect as relating to (a) land for roads; (b) cost of road making.*

The success of the work of town planning in Germany may be said to be due to the provisions relating to the width of street which by law the municipality can require. Under the Prussian Town Planning Act, 1875 (clause 15), a town council may require the owners of sites bordering the streets outlined in a town extension plan to give, without payment, the land for constructing a street 26 metres in width (85 feet 3 inches), and to bear the whole cost of constructing the street.

The successful administration of town planning in Prussia has been due to this clause, for under it town extension has not involved a burden of cost except in those cases where specially wide roads have been made, and even here the town councils of Prussia by negotiations have been generally able to induce the owners of sites to bear the cost.

The point is of such fundamental importance that it will be well to state it in yet another way to make it absolutely clear. So long as the roads outlined in a Prussian town plan do not exceed in width 85 feet, the owners of sites are bound under the Act of 1875 to give the land for the roads free and pay all the costs of road-making. The cost to Prussian municipalities of town extension planning is—as far as normal roads are concerned—therefore absolutely nothing. The principle embodied in the 1875 Act is practically that of most of our by-laws, viz., that the owners of sites shall give the land and pay all the cost of street-making.

There is, however, one vital difference between the Prussian standard and our standard. With us 40 feet (in some cases 36 feet, and in a few cases 50 feet) is a standard which at one and the same time prescribes a minimum of width permitted and maximum of width for which the owner can be required to give land and bear cost of road construction. Moreover, under the Prussian Act the municipality can, if it so desires, permit a road to be less than 85 feet in width, whereas under our by-laws every owner is compelled to make 40 feet roads (or 36 feet under some by-laws).

There is, therefore, a great need for clearly defining in the new town planning provisions the maximum width which town councils may require in regard to both width of roads and road construction.

It is obviously out of the question that the present standard of 40 feet should hold good for town extension work under the new Town Planning Act. No town council would ever consent to the payment by the municipal authorities of public money for the purchase of land and for extra cost of road-making when the 40 feet existing standard is exceeded.

Any payments thus made must be rigidly confined to special cases such as the construction of great lines of communication, the provision of specially broad promenades, boulevards, &c. The cost of making all normal roads must be borne by the owners and not by the ratepayers.

Happily the Local Government Board have power under the Act (clause 55 and schedules 4 and 5) to make provisions governing this question, and the Board will, without doubt, properly conserve the interest of the ratepayers by prescribing in these provisions that the grading of widths of roads for (*a*) main arteries, (*b*) secondary roads, and (*c*) residential streets, shall in a town planning scheme be secured without cost to the community.

## (C) The Cost of Wide Boulevards, Open Spaces, &c.

In Germany many of the wide boulevards have been constructed on the sites of abandoned fortifications. These sites have generally been sold to the municipal authorities by the Government, and after land has been allotted for the purposes of parks, open spaces and boulevard construction, sites for public buildings, &c., the remaining sites have been sold at prices which have often paid, or nearly paid the total cost of land purchase. The cost of boulevard construction in such cases has been paid by the municipality.

In other cases of specially wide new streets leading out of a town the municipalities have negotiated with the owners, and in most cases have been able to induce them to give the land, and pay all the cost of street making.

Where such roads are planned from the first to be used by tramway companies these companies bear a part of the cost. The owners of sites in specially broad streets, however, find that it is to their interest to have the streets of special width—for their heavier expenditure on road making is more than compensated by the increase in the value of their sites.

The land for open spaces and squares is also often given by the owners on the ground that their property adjoining is increased in value. In regard to these open spaces, &c., it is quite consistent for the municipal authority to pay a part of the cost of road-making.

## (D) The Distribution of Cost of Planning Between a Number of Owners of Small Plots of Land.

The difficulty of dealing with land in Germany is much more complicated than in Great Britain for there are in Germany a greater number of small owners and land speculating societies. The difficulty of dealing with the various owners has produced the Lex Adickes at Frankfort, and it is probable that before long this law will apply to most of the German cities. This law provides that where there are a number of small owners with interests in land to be dealt with in a town planning scheme the area can be treated in bulk and the cost of street-making consolidated. After the roads have been made, and deductions made for cost of road-making a redistribution of sites or values takes place. The process is, however, an intricate one, and as the matter is provided for in clause 58 of our new Act the actual procedure for dealing with such cases as these will, without doubt, be carefully framed by the Local Government Board.

## Summary.

In summarising these notes it may be stated that the first and last technical cost of preparing a German town-planning scheme, apart from the work of survey, is about 8*s.* per acre of land dealt with in the town extension plan.

The cost of the "general idea" plan is in Germany from 2*s*. to 2*s*. 6*d*. per acre.

The cost of carrying a scheme into effect is, as far as normal roads are concerned, nothing, beyond the cost of municipal oversight.

German town councils are safeguarded by the Act of 1875 against claims for compensation for land and cost of road-making so long as the road does not exceed 85 feet in width. All cases in which this width is exceeded are dealt with on their merits, and in most cases the municipal authorities are successful in inducing the owners to give the additional land and to pay the cost of extra road making.

It is a matter of most urgent importance that our town councils should be similarly safeguarded. If they are not thus safeguarded it will not be too much to say that hundreds of thousands of pounds of the money of ratepayers will be expended without proper justification.

### Additional Notes.

1. The Prussian law of 1875 referred to in the above notes has its equivalent in laws passed at later dates by other States in the German Empire. The standard as to width of road varies a little, but not much. In the adjoining kingdom of Saxony it is, for example, 24 metres as against 26 metres in Prussia.

2. In order to keep the issue quite clear, the fact that German councils in most cases make the streets has not been mentioned above, as the councils collect from the owners of sites this cost of road making as soon as the sites are covered. The fact however remains that the owners give the land free and pay all the cost of road making.

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The first resolution to be proposed and carried was as follows:—

"That in the opinion of this Conference it is advisable that the general course to be adopted in making a town plan should be left to the various local authorities, and that as far as practicable the $\frac{1}{2500}$th Ordnance maps be utilised for schemes with a view to minimising the cost of preparing the same."

Considerable discussion was aroused by the reference in the memorandum to the necessity for obtaining outside expert advice on the preparation of a town plan. Mr. G. T. Jackson, J.P. (Salford), emphasised the danger of making any general recommendation in the matter whereby it might appear as if they thought that their Corporations were not intelligent enough to know if they needed extra help. If the Act was to be made a success it was important that the autonomy of local bodies should not be interfered with.

Mr. T. C. Horsfall, J.P. (Manchester), said that the authorities of this country had not had intelligence enough to ask for town-planning powers until the evil had gone so far that the minimum of good would come from them. The unanimous experience of other countries was that an expert was of the utmost assistance. In Prussia, when they obtained a town-planning Act in 1875, they started without expert advice; but it was soon realised that mistakes were being made, and outside assistance was at once called in. The present local officials are doing extremely useful work, but the general health of the community is being ruined.

Mr. W. Harpur, M.I.C.E. (Cardiff), speaking as a city engineer, said that up to the present local authorities have had no voice whatever in town planning, and consequently officials could not be regarded as having been failures. The people responsible for town planning in the past were the landowner and his architect, whose chief aim had been to put his houses as close as possible. Now that the authorities had at last some controlling powers, they would see to it that such abuses did not occur again. To do this there was no necessity for expert advice.

Mr. P. Wright (Newport) contended that although the expert adviser might have proved a success in Germany, it should be remembered that the constitutional standpoint is different. In Germany the burgomaster was practically king, whereas in this country we are ruled on democratic principles. Borough surveyors understood the local conditions and requirements far better than any outside expert, whose first work always was to get all the information out of the local authorities and then to write a report at a substantial fee on it. The greatest evils of the past had been created by landlords and their architects, and it behoved those present to watch carefully that the new Act contained no loopholes which would allow a repetition of those faults.

Mr. Lasker (York Housing Association) regretted that there appeared to be such a dislike to the word "expert." Probably the number of people in this country who could be considered experts in town planning was not more than a dozen. It was only suggested that they should prepare a "general idea" plan; they would not go into the complete details. It was hard to see what harm would be done if the Local Government Board recommended the employment of one or other of these experts. The cost of so doing would be infinitesimal compared with the benefits that would arise.

Mr. Alex. R. Stenning (President of the Surveyors' Institution) said that the architects who are advising the big landowners do understand thoroughly what they are about, and that the owners were only too willing and anxious to make proper housing schemes. Overcrowding was caused not by them, but by the small landowner, who wanted to put as many houses as possible to the acre.

Mr. R. M. Cameron (Edinburgh) expressed a hope that it would not become a battle between the local authority and the expert. The intention of the Act was that each authority should do the best it could with its own problem. As there were no two towns in which the conditions were precisely the same, it would be well if each were left to attend to its own business.

The second resolution put before the meeting was as follows:—

"That this Conference is of opinion that in the future the land for all normal roads authorised in town-planning schemes should be provided and the cost of road-making borne by the owners of adjoining land, and not by the ratepayers, and that local authorities should have the power to require land to be given up to a maximum width of 80 feet for main arterial roads, and further to require the carrying out by the owners of road works to a width of 50 feet."

Mr. W. H. Hickson (town clerk, Rochdale) complained that the Act was not sufficiently definite as to who should bear the main or entire responsibility. It was desirable that general regulations should be so framed as to prevent any undue burden falling upon the local authorities. Under the present law the cost of laying out roads as required by the by-laws sometimes ultimately fell upon the local authority. Some towns already possessed exceptional powers of their own as to the width of roads, and it was desirable that they should not be surrendered for those in the Act.

Alderman E. Purcell (Liverpool) took exception to the statement that town planning had only been thought of in this country during the past year or two. They in Liverpool had been studying it for years. So far as their municipal powers would allow they had always insisted on new roads being made as wide as they possibly could; and where the owner would not do so they did it at their own cost, their total outlay on road widening during the past twelve years being one and a quarter millions. Under their own Act, which was passed last year, all new main roads are made 80 feet wide without the payment of any compensation to the landowners. If still more land be needed, it is paid for at the average price before development. In practice, landowners proved very willing to co-operate with the Corporation. Some with property on the outskirts approached the Council and asked that the new 80-feet roads should be joined up with their own as they found it enhanced the value of their property. Alderman Purcell proposed the following addition to the above resolution:—

"That in the event of more land being required for the purpose of further widening of the road, the owner shall receive payment at a price equal to the average price of the land before development."

This was seconded by Mr. Brodie (city engineer, Liverpool), and carried.

Mr. G. W. Bailey (town clerk, Bournemouth) also proposed that to the second resolution, requiring owners to carry out road works to 50 feet, as given above, the following words should be added:—"Or such other minimum width not less than 50 feet as local authorities are entitled to require under the local Acts or by-laws, or may in practice have obtained." By this addition those councils who already possessed greater powers than those outlined in the resolution would not have them taken away. The proposal was adopted. Finally the following resolution was agreed to without discussion:—

"That in the opinion of this Conference provision should be made in town-planning schemes for the building line to be defined (as in the Hampstead Act), and sufficient land dedicated in order that for future widening land may be taken by the local authority without compensation for constructing a road not exceeding 80 feet in width."

The short session of the Conference in the afternoon was mainly devoted to the discussion of three additional resolutions which had been sent in by representatives. The first was as follows:—"That in the opinion of this Conference provision should be made in town planning schemes for secondary or non-traffic streets or by-roads to be made of less width than that allowed under the by-laws, provided that the building lines on the opposite sides of such streets or roads be not less than 50 feet apart."

Mr. Shawcross, the chairman, said that the object of the above resolution was to minimise the cost of constructing those roads where it was not intended that heavy traffic should pass. Under present conditions there was a quite unnecessary expenditure of a large amount of money in making many roads capable of resisting the heaviest kinds of traffic, which would only have vehicles of the lightest kind. The money saved by removing this anomaly would be devoted to an improvement in the quality and comfort of the houses.

Mr. J. S. Birkett, solicitor to the Hampstead Garden Suburb Trust, said that when they came to lay out the suburb they found that all their intentions would be frustrated by the restrictions of the by-laws which prevented the arrangement of squares, &c., and rendered compulsory the making of even subsidiary roads to a width of 50 feet. As it was proposed that the majority of the roads in the suburb should be subsidiary ones, the outlay involved was very great. So the Trust got a special Act of Parliament, under which they are allowed to make roads, limited to 500 feet in length, of a width of 20 feet, provided that the houses on each side are not less than 50 feet apart. In this way they had been saved thousands of pounds, and in consequence the houses were able to be built better and let cheaper. Such a provision was of very great importance in the drawing up of town planning schemes, for it enables the architect or owner to lay out his sites to the best advantage for the occupants, and also with a finer artistic effect. Where a road was only wanted for access to the houses on that road, it was quite unnecessary to have wide macadam thoroughfares 40 or 50 feet in width, with their heavy initial outlay and heavy cost of upkeep. Of course, where wide roads are desirable, they were able to have them at the Hampstead Garden Suburb.

Councillor H. B. Bates (St. Helens) said that he knew from experience of instances where a great many small houses had had to be crowded together on a small area owing to the expenses of street construction having been so heavy.

Mr. J. A. Brodie (City Engineer, Liverpool) considered that if the reduction in the width of street works were accompanied by a proportionate increase in the open areas there would be no great objection to the resolution. In the Liverpool Act of 1908 the Corporation had power to deal with streets in that way.

Mr. T. C. Horsfall (Manchester) suggested that in a great many cases the open space insisted on by the Act could be given with much greater advantage in the form of playing grounds than in the form of streets of a quite unnecessary width so far as the traffic was concerned. The success of this arrangement had been already demonstrated at Sheffield, where there was an admirable grouping of cottages round an oval playground. If such an open space is provided, there was no objection to allowing quite a narrow space between the houses. It was of enormous importance that playgrounds should be brought near to the dwellings of the mass of the people. The children's health would be far more improved thereby than by insisting on wide streets.

Alderman E. Purcell (Liverpool) mentioned that in Liverpool they were now empowered to ask any builder or owner developing an estate for one acre in ten. Such open spaces are not paid for, but the owner is let off the payment of street works for a certain amount. The Corporation take the land over, and are responsible for the upkeep. There have been, so far, two instances where this power has been put into force. In Liverpool the minimum width between the houses was 36 feet.

Mr. Raymond Unwin expressed his conviction that it would be a great mistake to lay down any hard and fast regulation as to the exact width necessary for a street. In Hampstead a width of 50 feet has worked very well; but there might very easily be circumstances under which a lesser width would be desirable. If the reduction in the number of houses to the acre was insisted upon to the extent that they knew to be desirable, it was essential that the owner of the land should be spared the present exorbitant expense of the road construction. It was very necessary that the laws wielded by the authorities, that the legal requirements should be flexible and permit of the laying out of narrow as well as broad roads. It might be desirable in some places to have roads 80 or 100 feet wide, and equally desirable to permit of narrow ones. In the present day there was a great need for a law by which houses could be set back in by-roads or groves, so as to escape the noise of traffic. The interests of the public would, of course, have to be safeguarded by preventing any such facility in the case of roads which might be later used for heavy or main traffic. He therefore moved as an amendment that the resolution should be framed so as to include such a phrase as "Or such width as may be adequate."

Mr. W. H. S. Dawson (City Engineer, Bradford) thought that it was far better to have the open space all round the houses than in the form of occasional public playgrounds, which became in time a sort of no man's land. There would not, perhaps, be such an objection to these latter if they could be supported and maintained out of the rates. But even if they were upheld in this way, he was still of opinion that it was better for children to play in their own backyard than in any playground.

Mr. Horsfall said that if good was to be effected by this Act they would have to leave something to the discretion of the local authorities. He was perfectly certain that there would be no difficulty in getting an adequate amount of open space in a given area if the scheme is first drawn up by the local authority and then submitted for approval to the Local Government Board.

Dr. S. C. Lawrence (Medical Officer, Edmonton) said that as a medical officer of health he could not support the amendment. To introduce the word "adequate" was to use a word that was best barred. Moreover, the amendment was inconsistent with the spirit of their morning's proceedings, when much was heard of 80-feet roads. No official or councillor could be so wise that when he labelled a street as secondary he could be certain that it would not in 30 years become a primary road. His experience of common playgrounds did not lead him to be charmed by them. They shared the character of public schools in being hotbeds of disease.

It was eventually decided that the first resolution should be referred back for the consideration of the advisory committee.

The following resolution was accepted without discussion:—"That the Local Government Board be asked whether a local authority, under a town planning scheme, has the power to make any of the roads shown upon the plan when it wishes to do so, and whether in such cases the cost of such roads could be collected from the owners of the frontages either at the time the roads are made, or at the time that the adjacent land is built upon."

The third and last resolution, which, it was mentioned, came from Mr. H. V. Lanchester, was as follows:—

"That with a view to limiting the number of buildings to be placed on the land, it would be advisable to define these by the number of cubic feet of room space that can be placed on an acre of land, rather than by defining this in any other way."

Some discussion took place before it was decided to refer it to the advisory committee. Mr. E. T. Hall, F.R.I.B.A., insisted on the absurdity of strictly limiting the number of buildings to the acre and making the same number applicable to every class of structure, whether houses, chapels, warehouses, schools, and so on. He was also strongly in favour of being allowed to group houses together so as to leave large open spaces at intervals, as opposed to each house having its own little piece of ground. The proper way of dealing with a big scheme was to provide for playing fields as distinct from ordinary open space. The Dulwich College Estates governors, of which Mr. Hall is chairman, had set apart 160 acres of land out of two square miles for playing fields. The aim should be to provide a number of oases.

## ILLUSTRATIONS.

### LIVING ARCHITECTS.—NO. 30, SIR ROBERT ROWAND ANDERSON, LL.D., F.R.S.E.

### NO. 31, SIR THOMAS DREW, P.R.H.A., LL.D.

SIR ROWAND ANDERSON and Sir Thomas Drew are at the head of the profession in Scotland and Ireland respectively, and hence we have considered it fitting that their counterfeit presentments should appear together in our pages. We are able to inform our readers, amongst whom Sir Thomas Drew has many friends, that he is progressing slowly towards recovery after his recent operation.

### RUSHTON HALL, NORTHANTS.

WE illustrate some characteristic interiors by Mr. T. Graham Jackson, R.A., the nominee this year of the Royal Institute of British Architects for the Royal Gold Medal.

### DODFORD CHURCH—INTERIOR VIEW.

THIS illustration completes our series of views of Mr. Arthur Bartlett's very successful church, an account of which appeared in our issue of January 28.

## THE LIFE AND WORK OF WILLIAM BUTTERFIELD.*

(*Concluded from last week.*)

ONE somewhat curious fact connected with them was that, though signed by paymaster and contractor, his own name and address were both conspicuous by their absence from each and all of them—an embodiment of the adage "not the workman but the work"—a striking contrast to the habit of many grave-masons, the name of one of them in a recorded incident being so largely and so conspicuously sculptured on the gravestone that a wag, who, till then, had supposed it to be that of another man well known to him in life, asked the mason with seeming innocence if it was intended as a tomb for himself.

As has been well said, "Those who differed from him for the moment nevertheless greatly respected his character, because they saw, added to his high professional knowledge, a depth of religious feeling and conviction which could not fail to attract admiration."

His masterly care in the design and arrangement of tile pavements, and specially as to the right place for a peculiarly beautiful blue-grey tile of his, greatly exercised him; not content with this, his formulæ for their laying, and retention in a cleanly state when laid, appears in a somewhat lengthy document well worth perusing; it shows his great thoroughness.

It would ill become such as I am to venture to criticise the abandonment of the tile in church and other floors for the prevailing method at present of the marble chequers or the plain stone floor; all I would say is that the tiled floors of such men as Pugin, Butterfield, Street, Pearson, and others, and of a great amateur, the late Lord Alwyn Compton, Bishop of Ely, are too much things of beauty to be ignored or unprized; that they, one and all, should be the embodiment of much thoughtful attention is what I think all of you will agree about without much argument either way; that none of these methods fall into the rut of a mere passing fashion or craze might not perhaps be an unnecessary warning; any way, let us steer clear of the old French nursery jingle:—

"Dans la gendarmerie, quand un gendarme rit,
Tous les gendarmes rirent, dans la gendarmerie."

His mouldings usually are simple in section, but very telling in effect, and show his great gift of self-restraint and an entire freedom from fussiness; perhaps some of us might think the charm of a little more variety might have been better, but that was not his way.

His loyalty to, and love of, the English square end once led him, when at Norwich, to playfully describe the great apse of its cathedral as "a piece of Norman extravagance." Rugby Chapel, a case of necessity, is the only apsidal end of his of which I am aware. His reverence for St. Mark's at Venice, and his study of its motives, were very great. The patterns of his niello ornament were rich, varied, and marked the great value he set on subordinate matters. His love of the blue known as "cerulean" was often gratified in the decoration of his woodwork. His beautiful ridge-crestings which, after all that has recently been said in favour of the half-round ridge, were but a survival or revival of old methods; poor manufacture of unworthy and oftentimes vulgar models have, I fancy, had something to do with this change of procedure. Possessed as he was of the "single eye," there was nothing trivial, flighty, evanescent, or fashionable about his work; his natural reverence of mind and high sense of responsibility and duty, as he understood it, prevented this.

A slight discrepancy having occurred to a feature in a church of his, discovered some short time after its completion, its builder had little peace given him till it had been rectified; it was no case of "extras and omissions," but of simple obedience.

He objected to the term "organ chamber," preferring "organ room," and he preferred "nimbuses" to the more usual "nimbi."

That there was a certain lack of repose in some of his later works, many of his staunch admirers will be unable to deny. Generosity in his patrons may have contributed to it, proving that "the lean hound hunts the best."

His many designs in "Instrumenta Ecclesiastica" show great refinement, restraint, and originality. His great love of constructional colour only wants "the kindly hand of Time" to sober it into perfect beauty; may at least some of his works be left intact to receive it.

Possibly owing to my failure to understand the reason why, I may be pardoned for thinking that, unless it was unavoidable, his lozenge-wise diapers would have been less restless and disturbing in effect had they been made parallel (as they almost invariably are not) with the lines of the gables themselves.

His dealings with old work, though on the same lines as of the men of the Middle Ages, were scarcely perhaps at all times quite sympathetic; he built what he liked, and as he liked, sometimes a little perhaps to the detriment of the character and complexion of the old work adjacent; even in this he at any rate showed as much regard for it as have those who have already dealt with some of his own work. His numerous village churches, quaint and beautiful though they are, sometimes show some of this want of sympathy with ancient methods, both as to construction and design.

Those of you who know Caudebec, where one Guillaume le Telier, the architect, spent all his days and efforts on one church, and was finally buried in it, will marvel that Mr. Butterfield could have done so many, and so well, separated as they were both by time and distance, and each receiving so much of his personal attention. The failures in much of our work of to-day may in some measure be pardoned when we think of this great difference in modern methods which has caused the favoured few of us to be almost ubiquitous. Personally, I think better work, or at least brighter times, might come with a trifle more spreading of it.

### *The Man.*

So little that is known of his character as a man as I have, after some effort, been able to get together must be the sole apology I can offer for writing a comparatively brief paper, when I had fully hoped to be able to prepare a much longer one with which to test your forbearance.

His familiar figure was fairly well known when walking out for a visit to his club, the Athenæum, to get his "dish of tea," and perhaps to hold conversation with those persons there whose privilege it was to know him, or to write occasional letters on various Church matters, in which his trenchant and caustic humour found a congenial outlet; or, maybe, on architectural or antiquarian subjects to the journals most concerned with them.

We must not forget, too, his forceful methods as an admirable and voluminous correspondent; he not only wrote long and very scholarly letters, but every sentence and every word of them had its due place, weight, and measure most exactly apportioned. In courteous terms few could hit harder, or in more knightly fashion, those delinquents, be they who they might, whose faults and failings he deemed it to be his duty to hit; that word "duty" was to him in all ways and at all times a masterful monitor who would put up with no shuffling and tolerate no form of weakness that could be cured or averted.

Excellent letters of his on theological subjects have appeared from time to time in the Church papers signed "A Churchman"—they all teem with interest and originality and show clearly the bent of his powerful mental equipment. He was, as a Church dignitary once said of him, "no ordinary theologian," adding that "architecture is his least quality"; this, of course, in illustration of his value as a master of the first-named attribute.

He objected somewhat to "firms" of architects, being quite unable to understand how each, having a mind of his own, could manage to work comfortably with that of any other. This is, of course, a matter of temperament.

It may perhaps seem somewhat out of place here to say much as to his deeply religious life, and yet how still more feeble than they are would be my remarks, or indeed those of anyone else, were all mention of it to be omitted; it did not prevent, nor do I see any reason why it should, his occasional indulgence in a quiet humour quite his own, free though it necessarily was from all insane frivolity; such would have been opposed to his natural thoughtfulness.

That he came so little out of his shell was a distinct loss to his professional brethren, but he could not change his nature, and probably never attempted to do so. No better illustration of his hermit-like life and his retiring habits can perhaps be recalled than the fact of his non-appearance to receive in person the Gold Medal given by the late Queen Victoria, to the nominee, as he was, of the Royal Institute of British Architects (for the reception of which many of us would cheerfully walk a long way barefoot), on the plea that it would be "contrary to the habit of his whole life"; indeed, it is said that he went so far as to remark that he would rather relinquish it altogether than accept it, if the conditions compelled him to attend personally in order to receive it.

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* A paper read at the last meeting of the Architectural Association by Mr. E. Swinfen Harris, F.R.I.B.A.

No one could do otherwise with truth than recognise his amazing industry, which never once slackened during his long career till failing eyesight compelled him to desist.

Very few of the so-called practical men (so well put to rebuke by the late Mr. Micklethwaite) ever took more pains than did Mr. Butterfield to prevent chimneys from the chance of smoking. He would doubtless have been well abused had they done so (and, no doubt, some practical man sent for, as solely able to cure them). How few among those concerned are ever grateful to our friend in keeping them clear of the nuisance. His chimney-pieces at 4 Adam Street, seemed like a reflection of himself as in a mirror.

He united the Christian gentleman with the architect in a way which we may all strive to emulate, and, if we can, to copy.

Though perhaps hardly to be described as a "broad-minded man," he was most certainly a high-minded one, aiming at excellence rather than the dictates of any mere passing fashion; he never sought nor cared for popularity. He was opposed to the new cult of letting the workman think and act for himself, specially till found fit to do so. As a rule it is thus far at any rate to be feared that, in the abstract, he is not.

His loyalty towards good builders when found worthy after experience of them showed his keen sense of justice; his firmness in rejecting bad material soon revealed him to the slippery ones who had made experiments with him, as a man who would in no way allow himself to be trifled with. One of the former kind who built a house for me was so loyal to all his ways and habits that, though I was delighted to find such a rare form of virtue, I confess it became at times somewhat of a trial of patience to myself.

As I have said before, loyalty in others he could, and did respect: to wit, in speaking of his man-servant, of whose devotion to himself he always spoke with dry, but very sincere and deep personal regard. He possessed little, if any tenderness towards disloyal workers.

A frequent remark of his was, "Are you quite sure of your measurements?" and yet another, "People will abuse me because I will use brick." This latter was certainly made by one who well knew how to use it; his strong sense of the value of "texture" was very real years before it became a popular word with us of to-day; there was little sympathy shown by him in the use of any art cant, his method being rather to be art, than to talk about it.

A frequent reply to questions in conversation was "With a view to what?" as was another, used during his works towards adverse criticism, oftentimes as unreasonable as illogical, "Mr. ——, I have a conscience." We can say with Tennyson, he "reverenced his conscience as his King." Every line that he drew or caused to be drawn was the outcome of fervent and personal thought and devotion to his work, as he saw and believed it to be right, and he was never content or satisfied till the very best that could be contrived had been arrived at. The old saying that "the gods see everywhere" was quite unnecessary to him; he made it his business to do that, too, neither sparing his assistants nor himself over any small, or seemingly small, requirement; with him nothing was thought to be so. One great point in his favour was his feeling that all the parts in his work were necessary to the whole, not being, as is too frequently the case, studied merely as separate items, often quite "out of key" with the mass; in this his thoroughness in his work is generally apparent at once.

With the advertising spirit of his later days he had no patience.

His remarks on "Church Seats and Kneeling Boards," excellent in many ways, are somewhat marred by a too dogmatic spirit, avoiding deliberately, as they do, all elasticity or compromise to suit them to the possibility of adaptation to varying positions or circumstances. It is, however, only just to say that for some forty years he fought nobly for his system; as a friend of his has said, "A church was nothing to him if it did not lead to worship."

It speaks volumes that works so many, so various, so original and remarkable in many ways, should have fallen at all into the hands of so able and yet so reserved a man; this in itself is a comforting proof that reticence is little, if any, real barrier to those who have an opportunity afforded them of showing their knowledge and love of "The Mistress Art." His great seriousness in every phase of his long life was so different to the usual tone of life around him; this characteristic possibly grows less as time runs on.

In his later years he drew but little with his own hand (though few of his brethren had probably drawn in their time more than he); he spent very much thought and care in criticising and amending the work of his staff, his then idea being that it was a "waste of effort" to do otherwise.

It is perhaps to be regretted greatly, even from an archæological point of view, that the countless measured drawings of old work made by him (very much of which it is to be feared is now no longer in existence) have not descended to us for careful preservation, or, better, for opportunities of study and perhaps of fruitful inspiration. Probably his fear of mere soulless coypism of them may have led to other methods of dealing with them, but that, like many points of interest to us about him, will probably remain unknown. He was no mere imitator. Imitation may be "a sincere form of flattery"; with many nowadays it is frequently, I fear, an insincere form of robbery also. The only deliberate copying of any ancient work by him that I am aware of (and that, no doubt, with very full knowledge of its entire suitability to his needs) was when the mouldings of the caps and bases of the nave arcade in St. Albans, Holborn, being similar in section to those in similar positions in Tintern Abbey, were repeated with excellent results, thus proving the wisdom of his choice of them.

He ruled his own lines; they were those of none other. He "decorated his constructions, but never constructed his decorations."

I was, as a pretty constant attendant in the sixties at All Saints Church, Margaret Street, acquainted with nearly every line of it, and considered it then, as I still do, a masterpiece of planning and suitability to a most difficult site, besides being full of most interesting and original detail, all admirably put together, and in every sense well built.

We architects are sorely tempted to admire a fine church when we might perhaps be better employed, and even when worshipping in an ugly one we are still unsafe, being then tempted to reflect how much, were we but given the opportunity, we could improve it, therefore the works of Mr. Butterfield have not, and cannot be expected to escape our criticism.

### *The Friend.*

Grave and unsympathetic as he was supposed to have been to and by many, he was by nature one of the kindliest and most hospitable of men to those few who had the good fortune to possess his friendship; such always prized it.

My personal introduction to him was in 1867 at my old office in Duke Street, Adelphi (long since pulled down), and a most interesting memory it remains. The kind old friend who brought us together, still happily living, has given me much aid in preparing this short record, and specially in lending me the drawings on the walls of Melbourne Cathedral, Rugby parish church, and Ascot Priory, and thus showing you specimens of a cathedral, a parish church, and a community chapel. How I wish he were here to-night to describe that interview. His racy account of it would add much more to your edification and enjoyment than I can ever pretend to give you; few, if any, can be found to reverence the memory of Mr. Butterfield more than he. When criticising a window sent round for Mr. Butterfield's approval, he flipped at so many of the portions of it with his forefinger while objecting to form or colour, in order that these unsatisfactory parts might be taken out and substituted with something more to his taste, that the few surviving portions might well have reminded the glass-painter of the story about the model of Wallenstein's horse—"The head, neck, legs, body and tail are new, all the rest is the real horse."

Some few old friends may perchance be living who yet remember his familiar figure, Sunday after Sunday, in the church of St. Mary Magdalene, Munster Square, in days now long passed.

What a source of comfort is the feeling of the reality still attached to loyal work and service by the knowledge that one so forgotten to the world at large, as he seems to be, should be still so well remembered and honoured in his own profession, in and through the many works he has left us. "When I am forgotten, as I shall be, and sleep in dull, cold marble," is no more applicable to William Butterfield (so far as we are concerned) than it is to Cardinal Wolsey. We architects cannot look upon any of his buildings (whether known as his work, or not) without wishing to know more about them. We, at any rate, should always be thankful for the possession of these many remembrances of him kept green as it must be in and through his work.

Among the architects of the Victorian age alone what a wide field for study and observation might be evolved by any earnest young student among us as to their varied and various methods of producing their effective characteristics in their several works. For instance, if we compare those of William

Butterfield and William Burges we shall find in those of the former a simple directness of aim produced by the use of ordinary materials trained and used for a definite effect, while the other puts up huge stones for the sculptor to do his bidding by liberating from them, as it were, the racy figures full of humour, of forms, both human and animal, sacred and profane, hidden within them, full as they are of exhaustive (and possibly exhausting) studies from Greek and mediæval lore. So varied are the motives at work in various brains. As restorers or preservers of old work we shall do well to act on the wording on the tomb of another great architect of the same era (J. L. Pearson), "Sustinuit et Abstinuit."

Let us (when we can do so with a clear conscience) try and speak kindly of one another's work.

It is a good and hopeful sign that we are now so keen in our wish to know more of the ways, characters and personalities of the men themselves, as well as of their works, far more than has hitherto been cared about; like the pleasant reunions of the Royal Institute of British Architects, unknown in old days, this cannot but be helpful to us. The more we know of each other the better for the progressive influence of our art, nor is it at all inimical to that friendly rivalry which should lead us on to greater excellence. This has already been done here, at least once before, when George Devey and his works (many of which I know and greatly admire) were brought before you in an admirable address by Mr. James Williams, which, though I could not hear, I could and did read and think about with much enjoyment. Of a type differing from William Butterfield, he at any rate resembled him in one way, being in every sense a true English gentleman; like him too, in being brought in contact with many great and remarkable men, he could always hold his own with them, and receive, as he merited, their appreciation, both of himself and of his gifts.

We architects are not a wealthy body, and the exception does not prove the rule. May be, our epitaphs will resemble the last words of a divine, "I die, as a Bishop should, without money." May we also resemble that Bishop as to the latter half of the sentence too—"and without debts."

William Butterfield has gone to his rest, and well earned it. I can wish nothing better for the younger members of the Architectural Association than that they may live to meet with the same success he did, and may also be led to imitate him in deserving it, as he did; even after all a far better condition of things than being busy over undeserved work.

His funeral, in the churchyard at Tottenham, like his life, was, by his own wish, of a quiet and unostentatious character. He lies in the spot selected by himself adjoining his close and intimate friend Prebendary Wilson: so "in their death they are not divided."

In conclusion, I think I may venture in the name of those present to thank my friend on your behalf (as I certainly shall on my own) for the loan of those drawings by Mr. Butterfield, which he lent and sent me specially for your edification and pleasure this evening.

Mr. G. H. Fellowes-Prynne said it was with the greatest possible pleasure that he proposed a vote of thanks to the author of the paper, a friend of old standing, and he was sure a more enthusiastic lover of art and architecture did not exist. The paper really made them think of the past leaders of their profession, and he believed it would therefore be of great use to students. The architecture of Butterfield showed originality, strong feeling, and an intense love of colour, and although in the study of his work, as in the study of all artist's work, they must sometimes be disappointed, yet they must admit the disappointment came from their own standpoint, and they should remember that since they were apt to learn more by their own failures than by their successes, the failures of past leaders could be helpful in the same way. It was well to speak kindly of one another's work, and yet, if there was one profession in which unnecessary bitterness was often shown it was in that of architecture. Disparaging remarks were often made about a professional brother's work, and one wondered to what purpose, and in no case was that better exemplified than in the work of Butterfield. The men who generally criticised with bitterness were the least worthy to do so. Butterfield was one of the men over whom a battle of criticism had raged. The speaker could remember his being described as the Fra Angelico of the age, and though that was an extreme view —for it must be admitted he was sometimes placed on too high a pedestal—at the same time, there was that much truth in the title as befitted the originator of constructional decoration. They must not lose sight of the fact that he was religious from beginning to end. At the Institute on Monday last they had had a paper on Bodley, another Victorian architect with Butterfield. In the two men, however, they had two different characters, one unsympathetic and the other loving, and yet the two men absolutely akin in art, one constructional and the other a master in applied decoration. All the great artists of church architecture in the last century, especially Pugin, Street and Bodley, were men who had studied deeply the ancient work, and though influenced by it they all showed strong individuality, and it was certainly only the basis of their own architecture.

Mr. H. H. Statham, in seconding the motion, said the illustrations hung round the walls represented Butterfield's conservative attitude. They were interesting to him, and they would be to those who remembered the Gothic revival. The time of that passion for Gothic had now passed, but he had the feeling aroused by some of Butterfield's churches that they embodied that sort of originality which kept it alive still in spite of new movements.

Mr. F. R. Farrow said he hoped they would not forget to include in the vote of thanks their expression of gratitude to the friend of Mr. Harris who was good enough to allow the beautiful drawings by Butterfield to be exhibited that evening. Although Mr. Butterfield was a man of retiring nature, it would be of interest to members of the Association to know that he took a keen interest in their work, a fact which appealed to the speaker in a simple and unexpected manner. At one time, said Mr. Farrow, when he was giving a series of lectures at the Association on "Construction," Mr. Butterfield wrote him a long letter carefully pointing out the best method of laying tiles upon a roof and desiring him to impress upon the students the results of his experience. The letter was beautifully written, clearly argued, not merely as to the diction, but as to the proper method and the logical reasons for the method. That letter showed that Mr. Butterfield must have read and studied the A.A. Brown Book; it showed, too, that he had a keen interest in the instruction which was being given to the younger members of the profession. It showed also how jealous he was in his endeavour that the best should always be done in everything in connection with architecture. Mr. Farrow said he was perfectly unknown to Mr. Butterfield, a stranger to him, but because of his interest in the Association Mr. Butterfield had undertaken to write such a letter to one of the lecturers. Mr. Prynne had remarked on the coincidence that there were lectures on two great Victorian architects as Bodley and Butterfield in one week. They must all admire the work of those great men and recognise it expressed their individuality. It was the fashion to say nowadays that Gothic work was archæological, but those men of the nineteenth century were ardent students of all the old work ever done in mediæval times, and they expressed in every building that they did their individuality, and that was the charm of Butterfield's work. They did not imagine he was the same kind of man as Bodley or Street; they recognised that his was a different personality, and if for no other reason than that his work must always be worthy of study to students of the present day.

Mr. W. Millard said he had only seen, like many other students, Butterfield's work from outside, and that evening was the first time he had seen drawings of it. In referring to the criticism of another's work, he urged that it could not be fair until those who would pass judgment were acquainted with all the conditions and had examined the work from top to bottom, back to front, internally and externally.

Mr. Arthur Keen said he thought Butterfield was not only an artist, but that he was just as great as a constructor pure and simple. A letter from Mr. Halsey Ricardo had been handed to him that evening, and he wished to quote from it. Mr. Ricardo wrote:—"I have reverenced Butterfield's work since I was a schoolboy at Rugby, and my amazement at his power and the intensity of his romantic poetry of feeling increases as the years pass by, and I learn sadly the terrible difficulties of expressing oneself in building. The astounding majesty of the narthex at St. Albans, High Holborn, and the inexplicable beauty of the nave arcades of All Saints, Margaret Street, to take two handy London instances, compel one to shout and to cry at the same moment. How the conviction of the man burns through all he did."

Mr. Theodore Fyffe supported the vote of thanks, in which the President joined. Mr. Swinfen Harris briefly replied and the meeting terminated.

[In the list of works by Mr. Butterfield included in our last issue the church of St. Mary Magdalene, Munster Square, was inserted in error.—Ed.]

## PLANNING OF ELEMENTARY SCHOOL BUILDINGS.

Mr. H. D. SEARLES-WOOD, F.R.I.B.A., presided over a provincial meeting of the Royal Sanitary Institute at Derby on Friday, when the subject of school planning was discussed.

The subject was introduced by Mr. G. H. Widdows, A.R.I.B.A., the architect to the Derbyshire education committee, who has designed a number of schools since 1903, differing essentially from the central hall type. Speaking generally, the Derbyshire education committee had decided that the schools should be built to accommodate from 250 to 350 children (which is the best number for a teacher to supervise), and that the number of classrooms in a school should as a rule be six. Having dealt with a number of reasons in favour of a six-room school, Mr. Widdows called attention to the plans of his first attempt at cross-lighting and cross-ventilation, and said it was amusing now to read the correspondence of the Board of Education on the subject of this plan. It was trying to one's patience, but by sticking to their guns they got the plan through at last unaltered, for they then received the grandmotherly information that they were not to build more than five schools on those principles. For his part he would rather see the Board leading the way and providing provincial architects with good ideas, instead of which they had a Board which not only did not lead the day, but hindered those who were trying to get out of the rut. Some day the Board would find out that light and air were two of heaven's greatest blessings. Describing the plan, the author pointed out that the central part of the building can, by the use of screens, be turned into what is practically a central hall. In the case of infants the central part and the two corridors adjoining form playing places for the children in wet weather. It is a help to the teachers to be able to have the children divided into three groups at recreation time, instead of having them all together in a central hall. The corridors are 13 feet wide, and he fixed on this width because it enables two boys side by side to perform extended drill without knocking the walls or one another's knuckles. The corridors are provided on each side with double doors opening into verandahs. In wet weather no rain enters, and drill takes place in what is practically the open air. The verandahs, moreover, in wet weather provide shelters before the opening of school, and the cost of covered sheds is avoided. The windows in the end gables of the classrooms are swing lights and are 9 feet 6 inches from the floor, so that the light does not fall direct into the teacher's eyes. The side windows are provided with hoppers at the bottom and swing lights above, the hoppers being air inlets and the swing lights outlets. The hoppers open not more than four inches, and are formed with a deep rebate at the top, and thus compel the incoming air to travel in an upward direction. If hoppers are made to open more than four inches the air comes in horizontally, catching the teacher's head. To further assist the ventilation, more particularly in inclement weather, a fireplace is provided in each room, together with two 14 inch by 9 inch air flues, one on each side of the fireplace. These air flues are continued down to the floor, and have regulating grates at floor and ceiling level. It is essential that these should be continued to the floor, as there is more dead air below the level of the window-sill than above. The heating of our schools is, as a rule, by means of low-pressure hot water, with ventilating radiators in each room. No room has less than 14 square feet of heating surface per 1,000 cubic feet of contents, and if the rooms are at the end of a circuit this is increased to 18 square feet. In all cases ventilating radiators are reckoned at half the efficiency given in the catalogues to compensate for the extra quick circulation of air brought from the outside and warmed by these radiators. In the matter of lighting the net glass area is one-fifth of the floor area of each room. For artificial lighting electric light is used wherever available, but in most cases gas is the only illuminant to be had. In such cases they used single inverted incandescent lights arranged to spread the light equally, the bottom of the globes being 8 feet 3 inches from the floor. To obtain satisfactory lighting the ratio of candle power to square feet of floor area should not be less than 3 to 5. The classrooms are 11 feet in height to the wall-plate and 14 feet to the ceiling. Greater height produces an unnecessary strain on the teacher's voice. What we aim at is not a large body of dead air, but a smaller body of air frequently changed. When it is realised that each child ought to have 1,500 cubic feet of air per hour, it will be seen how necessary it is to change the air frequently and how little help is an extra 2 or 3 feet in height. It is, of course, desirable that as much sunshine as possible should be obtained in each room; and in a building with cross lighting it does not matter materially how the building is placed on the site, as sunshine is sure to reach each room some time during the day. The floors are usually of maple nailed to coke-breeze concrete, or are of wood blocks on concrete. He had tried two small jointless mastic floors, but neither has proved a success. He had also tried asphalt, but it is cold to the feet. There is a fortune awaiting the man who can bring out a suitable jointless floor which shall be both warm and durable. The walls and ceilings are plastered. In infant schools a height of 4 feet from the floor, and for older children 5 feet 6 inches, is made of hard plaster coated with green composition for free-arm drawing. This is cheaper than glazed bricks and serves a double purpose. Where possible cupboards are worked in as part of the structure, and cumbersome pieces of ugly furniture are avoided thereby. As regards painting, they rely on white and green externally. Internally the woodwork is usually a light green, and the walls above the dark green dado are treated a light warm buff. To show that cross lighting and cross ventilation does not tie one down to one type of plan, Mr. Widdows exhibited plans of other schools he had designed, and proceeded to touch on the arrangements made for sanitation. In conclusion, he said that the tendency among architects is to regard doctors as cranks and faddists. Unfortunately some are, but certainly not all. Architects will do themselves no good by ignoring the doctors. There are very few architects who understand ventilation, or who take the trouble to try to understand it. They swallow some firm's patent nostrums, and that is as far as they go. The doctors have come to stay, and architects must rise to the occasion so as to be able to debate the questions with the doctors. For his part, he hoped the Royal Institute of British Architects will go more into it, and make their examinations more drastic in the matter of ventilation, lighting, and heating. He hoped, too, that the day is not far distant when architecture will be made a close profession, just in the same way as law and medicine, and when the time comes for a Bill to be presented in Parliament, he appealed to medical men to give their support, and help in getting that Bill through. It is time something was done. In Derbyshire he had seen a window-blind on which the advertiser describes himself as "architect and undertaker." Let them hope that this will soon be no longer possible, and that the Local Government Board will guarantee official architects their position, just as they have done in the case of the medical officers of health. It is to be regretted that education architects have not a society among themselves, so that they could meet and discuss the various difficulties that arise. Such a society would be of inestimable value; but we are all so busy that it has been, so far, impossible to find anyone able to spare the time to start such a society. A difficulty would be met at the commencement as to who should be admitted. In some counties the schools have been placed in the hands of the county surveyors. Can it be said that in all cases such are architects? Have they had the proper training? He could not understand anyone satisfactorily performing both duties. In all but the smallest counties there is sufficient work in each department to keep an official going. How, then, can a county surveyor give the proper time and attention to schools? Be that as it may, official architects lose much by not having a society. From the Board of Education they get practically no help; merely criticisms, and these anyone can make. On a committee, too, there are sometimes members whose actions do not conduce to efficient and smooth working. A society would be of great value and assistance in dealing with such men.

Mr. R. G. Kirkby, A.R.I.B.A. (Bradford), said there was no doubt that in a few counties reform has taken place in regard to school planning, but it was much to be regretted that perhaps 70 or 80 per cent. of the schools being erected in the country were totally unsuitable for the present requirements of education. He had lately visited a number of schools in Birmingham, Staffordshire, and Derbyshire, and certainly considered Mr. Widdows's schools were much superior to many of the types they saw exhibited on the walls. Mr. Widdows had been successful in obtaining good light and efficient ventilation in every classroom. He had been much struck with the great marching halls in the German schools, and thought there should be more provision made in English schools for physical culture. The conditions of Staffordshire and Derbyshire differed from those of Bradford, as they had in those counties flat sites and positions which were not exposed, and he felt that the schools being erected in Bradford were more suitable for that city. At Bradford he was planning a school with verandahs facing the south in order that in summer time the side of the classroom could be thrown open and the children would be practically in the open air. He was very much impressed with the adaptability of Mr. Widdows's schools, and their general artistic appearance both inside and out.

Dr. Reid, medical officer of health for Staffordshire, referred to his astonishment when after the Education Act he received a plan for a new school of the central hall type. He refused to pass it, and as a result of consultation with the architect they came to the conclusion that the only way to build schools was to build them as they did hospitals. Dr. Reid described the salient features of the now well-known Staffordshire pavilion schools, and strongly urged that all schools should have cross window ventilation. He would go further, and would not pass a school which opened into a corridor. It had been said that the pavilion type of schools occupied a large site and were costly to build, but that was not so. There was no reason why they should not have two or three storeys each with verandahs, and as a matter of fact at Bangor they were building a three-storeyed University on that plan. In Staffordshire they allowed 40 inches of ventilation per child, and the air was changed six times an hour, and they allowed 26 to 28 feet of heating area per 1,000 cubic feet.

Mr. Owen, His Majesty's inspector of schools, thought the differences with the Board of Education had been exaggerated. He admired Mr. Widdows's work, but at the same time he was one of the most daring school architects of the country, and he would not condemn many of the schools which had been built under the regulations of the Board of Education. Mr. Widdows himself admitted that architects did not understand ventilation, and surely architects must have been asleep, for they were called on to design schools before the passing of the Education Act.

Mr. Edwards, city architect, Sheffield, pointed out that the primary consideration in the planning of schools in the past was to secure proper supervision by the head teacher, and now he thought they were inclined to rush to the other extreme, and they might make a mistake in treating schools purely as seminaries. A great many of the mistakes in school planning were undoubtedly due to the competition system, because an architect knew he would stand no chance of winning a competition if he went far outside the usual lines. He considered it an advantage to have an official architect who could consult with various other officials.

The Chairman said the central hall system was introduced from the point of view of supervision. He deprecated the idea of forming another architects' society, and pointed out that if school architects wished to meet and discuss matters, the Royal Sanitary Institute would afford them facilities.

Others who took part in the discussion were Dr. Berwise, the Mayor of Derby, Mr. E. W. Small, and several head teachers, one of whom, Mr. Cley, of Long Eaton, said that since being in a school built by Mr. Widdows his staff had not suffered at all from teachers' sore throat.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE great church of Santa Sophia at Constantinople formed the subject of a paper read by Mr. J. B. Fulton, A.R.I.B.A., before the Society at a meeting held on Thursday evening, February 24.

Mr. Fulton, who has made an extensive study of this building, dealt in detail with the historical circumstances surrounding its erection. Built in the sixth century A.D., by order of Justinian, to replace the old church which had been destroyed by fire—the cause of which may have been a suggestion from the Emperor himself—it occupied five years ten months from commencement to dedication.

The work of Anthemius of Tralles, the greatest architect the world has ever known, Santa Sophia ranked with the temples of Karnak and the Athenian Parthenon as one of the great pinnacles of architecture.

Spanned by a great dome vieing in beauty with the blue dome of heaven over the Sea of Marmora, the cliffs, flowers and forests of his beloved land of Asia Minor, Anthemius's masterpiece surpassed all previous works, and stands to-day —to quote Mr. James Fergusson—"the most perfect and the most beautiful church which has been erected by any Christian people."

It was the culminating point of ancient art at which for once in the history of art east and west joined hands, a lasting monument to the genius of Anthemius.

Structurally, Santa Sophia, on the authority of M. Auguste Choisy, astonished its contemporaries by its wonderful lightness; to them it appeared, to use their thoroughly Oriental form of admiration, that its dome was suspended in space by an invisible power, so slender were the supports that upheld it. Yet so sound and logical was the construction that with the exception of the four corners which were evidently the weakest points of the building, and had been thrust about 18 inches back from their original positions, the vast system of arches stood to-day apparently sound. Everywhere, both within and without, great piers had been built, and after the Turkish occupation, the four minarets were built in the sixteenth century.

Internally, the acoustics were perfect, and the original arrangements were such as to give appropriate emphasis to the altar. In the words of Professor Aitchison, "As the interior of the Pantheon strikes one as the most sublime building, the exterior of the Parthenon as the most perfect, the exteriors of some of the French cathedrals the most wonderful, the interior of St. Mark's as the most gorgeous, so the interior of St. Sophia strikes one as the vastest building one has seen."

The great beauty and charm of the interior lay, not only in the constructive features, but also in the power and beauty of great horizontal cornices placed at the correct relation to heights and broken only on plan. To the speaker this was the secret of Byzantine design, and nowhere had it been used to greater advantage than in this vast pendentived hall.

Standing at any point in the nave, the eye moved from one vista to another in endless variety. The golden vaulting of the aisles and galleries gave colour and distance, while all the nearer features carried the eye to the great dome crowning all.

The views of the nave from the aisles and galleries were unsurpassed, the columned low-vaulted richness of the aisles contrasting with the seemingly infinite height of the nave.

Analysing the details of the plan, Mr. Fulton explained that the four great stone piers or buttresses measured 67 feet 6 inches by 25 feet 2 inches by 101 feet 8 inches apart from north to south, and not only did they carry the weight of the cross arches, but were also designed to take the thrust of pendentives, supporting dome, and cross connecting arches supporting dome.

The necessary depth of the buttresses allowed for openings to be left forming the north and south aisles; while the thrust of the dome necessitated the buttresses being carried to the height of the base of the dome far above the roofs of aisles, forming features in the elevation which are so charming and logical.

The dome, supported upon forty piers, rose 46 feet 9 inches above the cornice, and internally ribbed ascended to a great circle 37½ feet in diameter. The length of the church exclusive of apse, was 244 feet 6 inches, while its breadth, including aisles, was 228 feet 10½ inches.

Mr. Fulton illustrated his paper by a number of photographs of the building, and a beautiful and interesting series of measured drawings and sketches.

A vote of thanks was accorded Mr. Fulton for his lecture, and a discussion led by the president, Mr. Percy Robinson, F.R.I.B.A., followed.

## SEVENTEENTH CENTURY HOUSES IN NORTHAMPTONSHIRE.[*]

THE early part of the seventeenth century witnessed in England a great change in architectural style. No set of architectural forms has remained unaltered for any great length of time. There has always been a tendency towards change. But during the Gothic period—*i.e.* from about 1100 to 1500—there was a strong family likeness between all the successive forms. The sixteenth century saw the introduction of a fresh strain of blood—the Italian—and the seventeenth century saw the complete domination of architectural treatment by Italian detail. It was in the early years of that century that the foreign forms began to gain the mastery over those handed down by the ancient Gothic traditions: traditions, however, which died hard, and, like the remnants of a conquered race, maintained a precarious existence in remote districts.

Northamptonshire is famous for its spires and its squires; it is, therefore, a matter for no surprise if the churches connected with the former and the houses connected with the latter are worthy of particular attention. As a matter of fact it is a county extremely rich in architectural treasures, and a general history of architecture, both ecclesiastical and domestic, could quite well be illustrated by examples taken only from within its borders. It has many villages. Horace Walpole called it "a clay pudding, stuck full of villages," and there are few of its roads that would not take you in an hour's drive, by the almost obsolete method of horse-drawn vehicles, through four or five of them.

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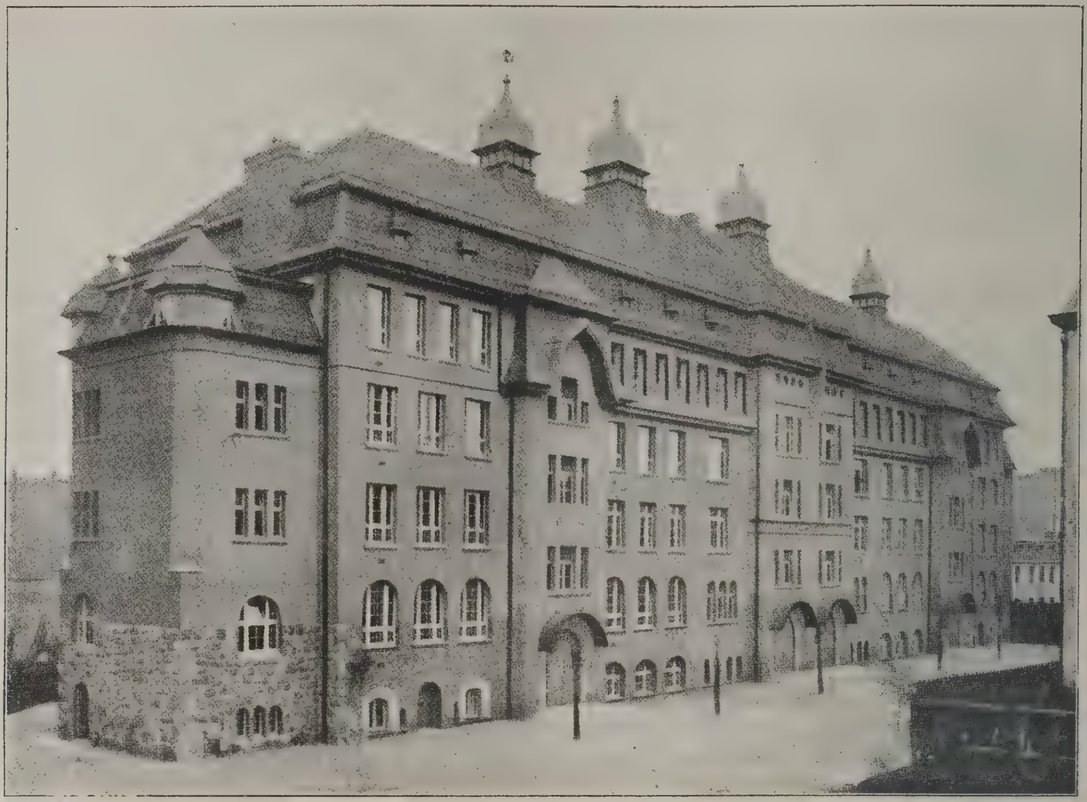
[*] A lecture delivered by Mr. J. Alfred Gotch, F.S.A., F.R.I.B.A. on February 24 at Carpenters' Hall.

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Das Schulhaus.*

PUBLIC ELEMENTARY SCHOOL AT KONIGSBERG.—Herr Stadtbauinspector PAPENDIECK, Architect.

The county, therefore, is an admirable district in which to study old houses; and it possesses, among others, some fine examples of those of the seventeenth century; and the conditions are rendered all the more favourable by the fact that the native building material is a very excellent stone.

About the period under consideration a number of men, famous in history, had houses within the shire. John Norden, the surveyor, writing in the closing years of the sixteenth century, and finishing his work in 1610, said, "The fertility, salutary air, pleasant prospects, and conveniency of this shire in all things to a generous and noble mind have so allured nobility to plant themselves within the same, that no shire within this realm can answer the like number of noblemen as are seated in those parts." He then goes on to give lists of over fifty men who lived in fine houses. Among them may be mentioned Lord Burghley, at Burghley House; Sir Christopher Hatton, at Kirby and Holdenby; the Lord Mordaunt, at Drayton; Sir Anthony Mildmay, at Apethorpe; the Lord Compton, at Castle Ashby; Sir Edward Montagu, at Boughton; Sir Thomas Tresham, at Rushton; Sir John Spencer, at Althorp; John Brudenell, at Deene; and Edward Cope, at Canons Ashby, whose daughter married a Dryden. But in addition to men with well known names were many others (one in almost every village), squires who housed themselves comfortably and left tangible evidence of the prosperity of the time in the shape of handsome houses.

A great number of these houses have disappeared; some have perished along with the families who built them, others have been replaced by more modern structures. But there are enough remaining, either wholly or in part, to give us a very good idea of the kind of house that was in vogue when James I. occupied the English throne.

There is, for instance, the manor house at Great Addington, typical of many manor houses of the county, simple but picturesque in outline, depending on its gables, its large chimney-stacks and its mullioned windows for its interest; or Pilton manor house, the home of one branch of the Tresham family, placed, as most manor houses were, next to the church and grouping happily with it. The church itself has more than local interest, for here in the year 1630, when the manor house was still comparatively new, were married the parents of John Dryden. Again, there is an old house at Chacombe, in the south-west of the county, called the Priory, which was rebuilt in the eighteenth century, but retains its quaint porch of the seventeenth.

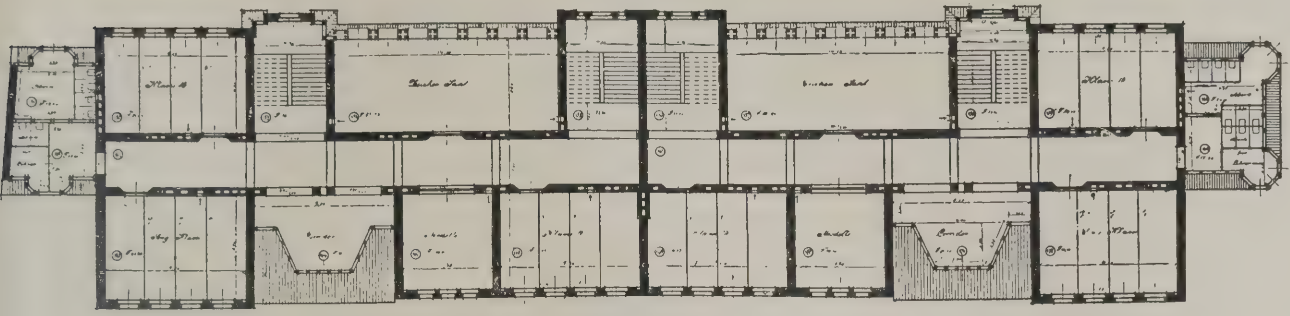
So far there has been little or no evidence of Italian feeling, nothing, indeed, beyond the symmetrical treatment which the study of Italian models fostered. Here we get a touch of Classic detail in the balusters just below the roof of the porch, and in the little obelisks which adorn the busy gable; the gable itself derives its ancestry probably from Dutch sources, either directly through the imitating of Dutch masons, or else indirectly through the study of Dutch books of design. This is a strong probability, but by no means a certainty; for a great deal of the foreign-looking work of this period was designed and wrought by English craftsmen.

Among the smaller houses may also be mentioned one at Hardwyck, built by a Sir Francis Nicholls, whose descendants have long disappeared from their home, but who has left as his memorials the remains of his house, a tomb in the church and a charity. The house has suffered much since it was built as a manor house; it is now a farm-house, whose windows the cocks and hens may approach without presumption, but it retains a quaint circular bay-window, adorned, after the fashion of the times, with the coat of arms of Sir Francis, the builder.

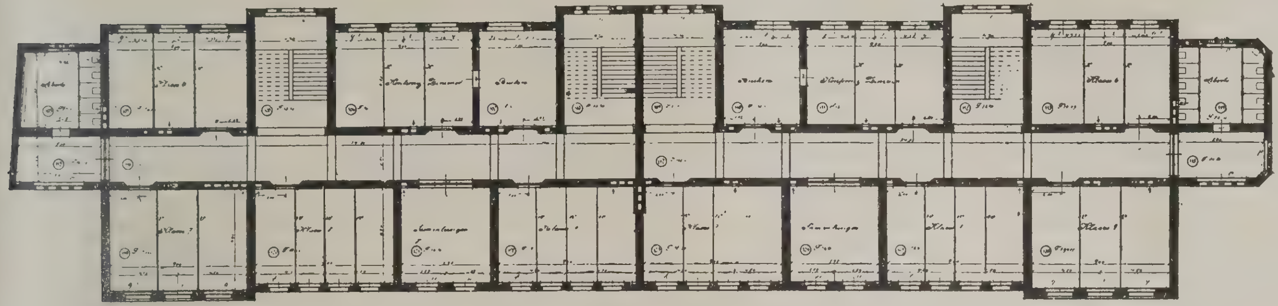
Hardly distinguishable from these houses in point of style, although built nearly fifty years later, is a house at Brockhall, which bears the date 1677. When we remember that at this time Sir Christopher Wren was rebuilding the City churches, and that St. Paul's Cathedral was already designed, and, indeed, begun to be built; when we compare the fully-developed Classic treatment of these buildings with this little farm-house, we can realise how long the old traditions lingered in remote places. The same moral is pointed by the Grammar School at Clipston, partly school, partly master's house, and partly almshouse, built in 1672. The only touch of the later manner is in the central turret, which may be a later addition.

So far the houses we have seen have been the simple efforts of village workmen, the unpretentious vernacular of the country-side. We will now look at some houses of more importance, where design was more consciously studied. The first of these belongs to a very curious group, the outcome of the quaint pedantry which marked the closing years of the

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



THIRD FLOOR.



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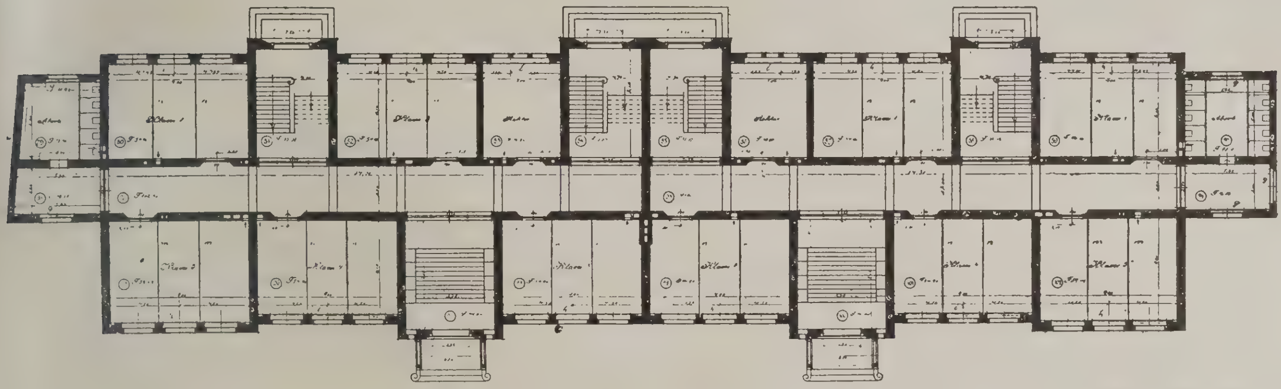


GROUND FLOOR.

[From *Das Schulhaus.*

PLANS OF PUBLIC ELEMENTARY SCHOOL AT KONIGSBERG.—Herr Stadtbauinspector Papendieck, Architect.

sixteenth century and the opening of the seventeenth. It was built by Sir Thomas Tresham, of Rushton, a leader of the Catholic party in Elizabeth's reign, and a man who suffered much for his religion. He passed many years in confinement, but emerged from time to time into a restricted freedom, and being a great builder, he seized these opportunities to carry out curious schemes which he had evolved in the weary hours of his imprisonment. One was a triangular lodge in the grounds of his home at Rushton; this embodied the idea of the Trinity, everything being in threes or multiples of three. Another was a small house which he built near another seat of his at Lyveden. This sets forth the Passion of Christ. The building is in the form of a Greek cross, with a great bay at the end of each arm; each side of each arm is of the same length, the body of the plan thus consisting of five equal squares (four arms and the centre). In the frieze of the top cornice is a series of Latin legends, appropriate in their reference to the object of the building. In the frieze of the lower cornice is a series of seven devices emblematic of the Passion, duly recurring. They comprise the cross, the crown of thorns, the ladder, the lantern, swords, spears, the seamless garment and the dice, the money-bag and thirty pieces of silver. Round the base of the building is placed a row of shields which have never been carved, but which, like those on another building of Sir Thomas's, the Market House at Rothwell, may have been intended to contain the arms of his friends. The detail of the windows is in the ordinary manner of the time and district. The cornices are of the most refined Italian profile; there is no building of the period which has their equal in this respect. The front door is "correct." The internal detail is more mixed, but before briefly examining it a sight of the plan will bring the quaintness of the building more vividly before you.

In the interior the subsidiary doors are, many of them, flat pointed, and where they are treated in the more fashionable Classic manner, there is a certain freedom of handling which relieves them of insipidity.

Lyveden was not the chief seat of the Treshams, that was at Rushton; but it was an important place, and the grounds were laid out in a manner almost lordly. Not much of this work is distinguishable at the present day. This building, which you have seen, was not the principal house at Lyveden; it was in the nature of a toy, and lay at some distance from the actual manor house, beyond the ornamental gardens. Behind the chief house, a considerable portion of which still exists, stretches a large grass field, where may be dimly discerned the curved banks and gentle slopes which formed part of the lay-out, now almost obliterated by "Time's fell hand." But at the top of the field there is a long terrace of earth with a prospect mount at each end, and along one side of it runs a narrow sheet of water, part of a large canal or lake. Nearly three centuries of neglect have overwhelmed the design, but this fine terrace, and the straight lengths of water, now black with overhanging bushes, stir the imagination to reconstruct what must once have been a magnificent piece of garden planning.

Lyveden new building was still unfinished when Sir Thomas Tresham died in 1605, and it was never completed, for his eldest son Francis was deeply implicated in Gunpowder Treason, and a few months after his father he too died, in prison, and so cheated the headsman.

The estates were confiscated and the chief seat of the family, Rushton Hall, was involved in the ruin. Lyveden eventually came back to the family, but Rushton passed away for ever, and was purchased by the Cokaynes, Viscounts Cullen, who established themselves there for two centuries. This transference had important architectural consequences, for after a few years the new owners began some very considerable building operations which gave the house its distinctive character. In approaching it, the whole of what is seen (except the south front, which was rebuilt after a fire in the middle of the last century) is Cokayne work. It is only after entering the court-yard that the earlier work is visible. The original house of the Treshams had been built about the beginning of the sixteenth century, and Sir Thomas had done something in the way of alteration and embellishment. It had been built round a court-yard; the Cokaynes lengthened two wings of the court and connected them with a one-storey arcade, or corridor. They also added an attic storey with a balustraded parapet broken at intervals with large dormers. The whole effect is singularly happy, combining stateliness with a pleasant play of fancy. The Cokaynes followed the lines laid down by their predecessors, and whereas Sir Thomas had ornamented his gables with the trefoils of Tresham and the date 1595, they made use of the same detail, but adorned it with the cocks of Cokayne and the dates 1626, 1627, and 1630. And so, standing in the court-yard at Rushton, as the eye wanders from gable to gable, you are reminded of one of the most picturesque events in English history and of the downfall of a once powerful family.

Inside the house there is very little original work left; the only features of our period are the ceiling of the principal staircase and a doorway on the same, the stonework of which is a good example of the Classic manner of the early seventeenth century. It surrounds an oak door which follows the traditional treatment of the preceding hundred years.

One of the daughters of Sir Thomas Tresham had married Sir Thomas Brudenell of Deene, afterwards created Lord Brudenell and Earl of Cardigan, an ancestor of the Lord Cardigan of Balaclava fame. Into her new home she carried from the wreckage of her family possessions at least one interesting relic, a portrait of her father in a gorgeous suit of armour. Her husband lived in a fine house which had been built in the reign of Edward VI. His uncle had done something in the way of embellishment, but he himself did not only this, but a large amount of substantial building. The old house lay in the customary way round a court-yard, entered through a plain, low-browed archway.

Sir Thomas Brudenell built a tower at one end of the front, he added a wing here, rooms there, and gablets in many places. The effect is very picturesque, and the whole house, with its work of different periods, of Edward VI., Elizabeth, and James, of the eighteenth century, and again of the nineteenth, is extremely interesting. That with which we are now concerned, however, is that done by Sir Thomas in the first quarter of the seventeenth century. It is characteristic of its period. It is more substantial, less full of delicate fancy than the earlier work. Heraldry then played an important part in the decoration of houses; it had done so in Elizabeth's time, it did so even more in James's. Sir Thomas Tresham had employed it in all his buildings, and, doubtless, his daughter fostered her husband's taste in the same direction. Sir Thomas Brudenell placed shields of his ancestors' arms round his new tower; his own and his wife's he placed by way of ventilators in a little projecting chamber which he added on one of the fronts. He placed them again on chimney-pieces, and more particularly in his new plaster ceilings, where he endeavoured, within the space at his command, to set forth the principal facts of his ancestry and that of his wife.

Pride of family was a common foible in those days (it is not wholly extinguished in the present), and not a few notable men of the time were declared by their detractors to have invented ancestors, and in one case even to have filled windows with ancestral arms to which they had no shadow of a claim. Fortunately, the respectable people with whom we are now concerned had no such detractors, and the interest which Sir Thomas Brudenell rightly took in heraldry was shared by his brother magnates. Sir Francis Fane, for instance, who married the daughter of Sir Anthony Mildmay, of Apethorpe, filled his ceilings with the alliances of his ancestors when he enlarged his house on coming into possession in right of his wife. The ceilings at Apethorpe are finer than those at Deene, and are, indeed, among the best of that period. One room is largely devoted to Neville heraldry, Sir Francis's mother having been a Neville; another is chiefly concerned with Fane alliances. In both cases the net-work of panels, with their delicately moulded ribs, are thoroughly characteristic of Jacobean work.

*(To be concluded.)*

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* devotes the major portion of its illustrations to the "palace" of Charles Beyerle, Esq., at Cairo, Egypt, a swagger house with plenty of marble and elaborate Italian Renaissance detail, of which Mr. Carlo Prampolini is the architect. The remainder of the illustrations are given to students' work of the Society of Beaux-Arts Architects.

*La Construction Moderne* illustrates an Italian country house, the Villa Rosa, at Collanzone, by M. Alfredo Melani, a not too exuberant "Art Nouveau" design, and the principal buildings of the exhibition at Seattle, Alaska. In the series of articles on Old Paris, the abbey of St. Germain-des-Prés is now described and illustrated.

*Arquitectura y Construccion* gives views of a costly mausoleum in the cemetery at Barcelona for the Rocamora family, by D. Julio Fossas, and the new station at Bilbao of the Bilbao-Santander Railway, of which the architect is D. Severino Achucarro. From France our contemporary illustrates a block of residential flats in the Rue de Labiche, Paris, designed by M. Alex. Fournier.

The *Architectural Review* (Boston, U.S.A.) gives a description with many views of the Hotel Meurice, Paris, of which M. Nenot is the architect, and geometrical drawings and details of St. Paul's Church, Butler, Pa., by Mr. John T. Comes, and the Illinois State monument, in the National Military Park, Vicksburg, Mass., designed by Messrs. Jenney & Mundie.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### Llandaff Cathedral.

SIR,—I notice the continuation of the interesting article on Llandaff Cathedral by S. Bowen Williams, M.S.A., has been omitted from the last few issues, and I should be glad to know if it is your intention to insert the remainder.—Yours faithfully, G. LL. REES.

Birmingham: Feb. 24, 1910.

[The completion of Mr. Bowen Williams's article will appear as soon as space permits, together with further illustrations of Llandaff Cathedral.—ED.]

### Fonts and Monuments.

SIR,—Your most interesting abstract of a paper on "Fonts and Monuments" is marred by two slips on page 136. (*a*) In first column, last par but one. The bronze figure is not on the tomb of Thomas Beauchamp, Earl of Warwick, who died in 1370 (should be 1369), whose tomb is in the choir of St. Mary's, Warwick, but on that of Richard Beauchamp, Earl of Warwick, who died 1439, whose tomb is in the Beauchamp Chapel. (*b*) In second column, close to end of article. For Thomas Beauchamp read Richard Beauchamp. I hope you are going on with those pictures of Oxford and to follow them with those of Cambridge.—Yours faithfully,

Ilminster: Feb. 27, 1910. R. J. W. DAVISON.

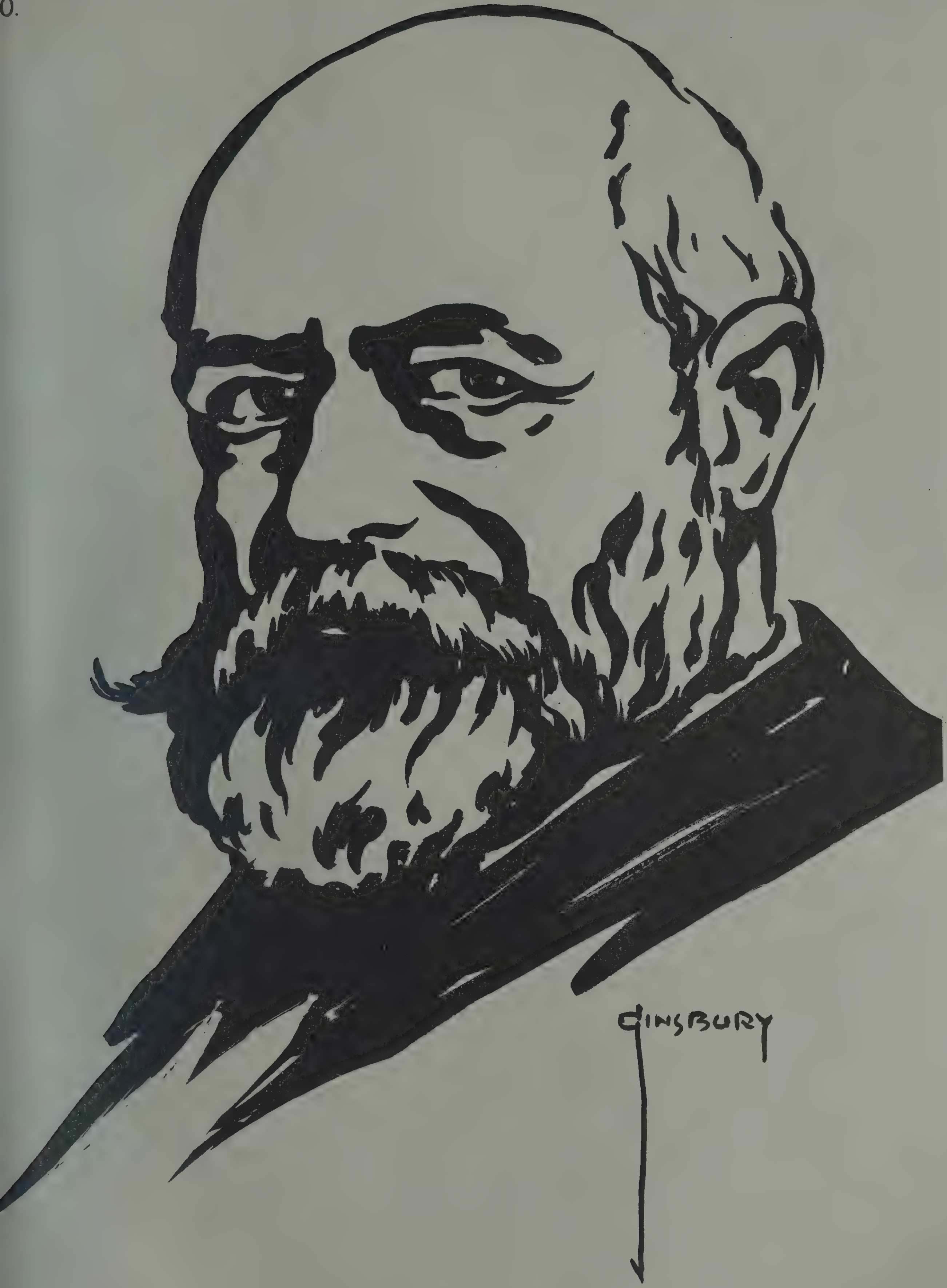
## GENERAL.

THE Bolton Corporation are about to undertake the erection of two new police stations, one in Green Lane and the other in Lever Edge Lane.

THE restoration committee of St. William's College, York, have given instructions to Mr. Temple Moore, the architect, to proceed at once with that part of the building which is to be the Maclagan Memorial Hall for the use of the Lower House of Convocation.

THE Bangor and Beaumaris Board of Guardians have decided unanimously to adopt the report and recommendation of the architect to the Local Government Board as to building a new workhouse infirmary at a cost ranging from 10,000*l*. to 12,000*l*. A committee was appointed to secure a site and select an architect at once.

Living Architects. No. 30: Sir Robert Rowand Anderson, LL.D., F.R.S.E.



Living Architects. No. 31: Sir Thomas Drew, P.R.H.A., LL.D.

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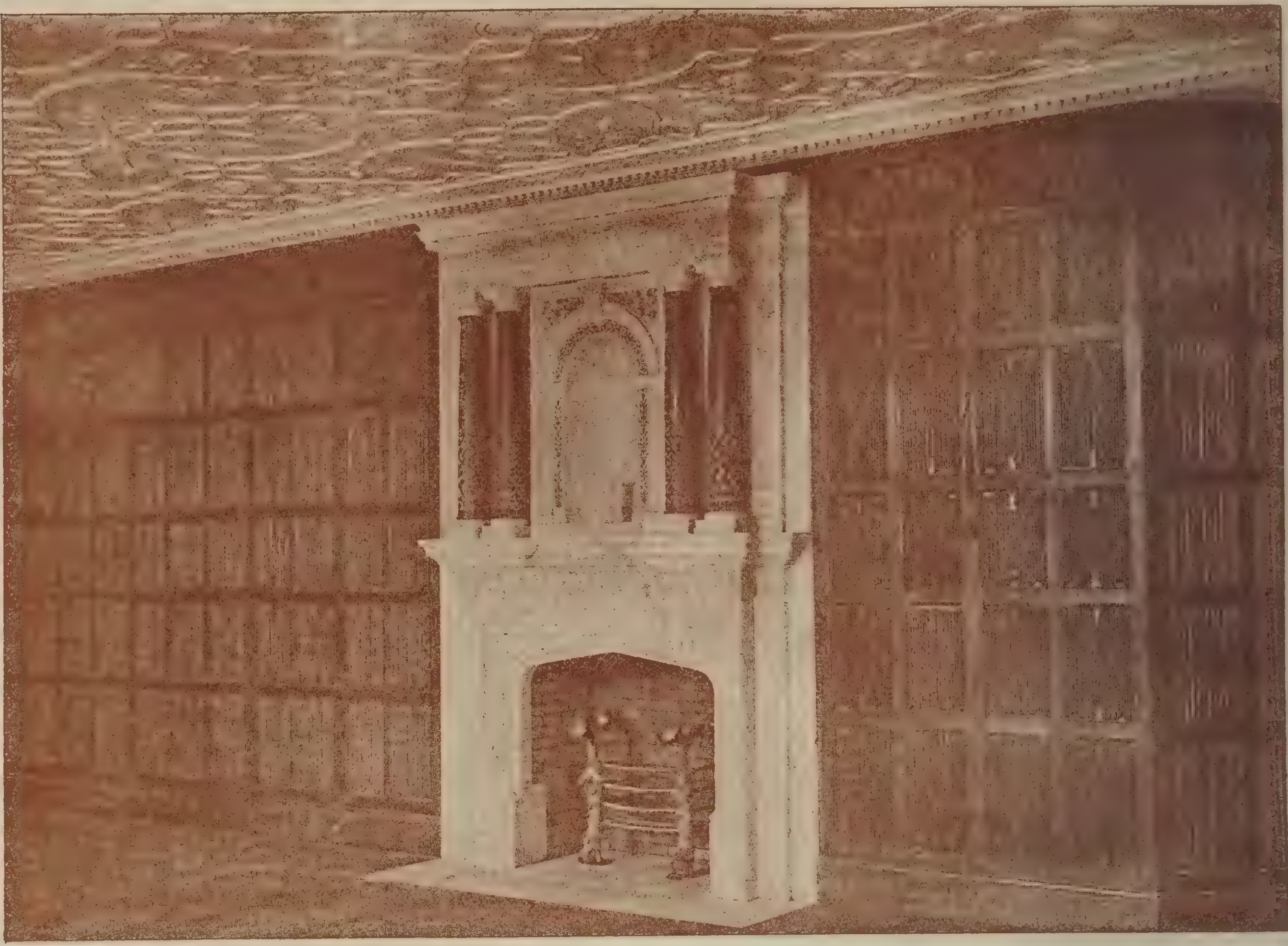

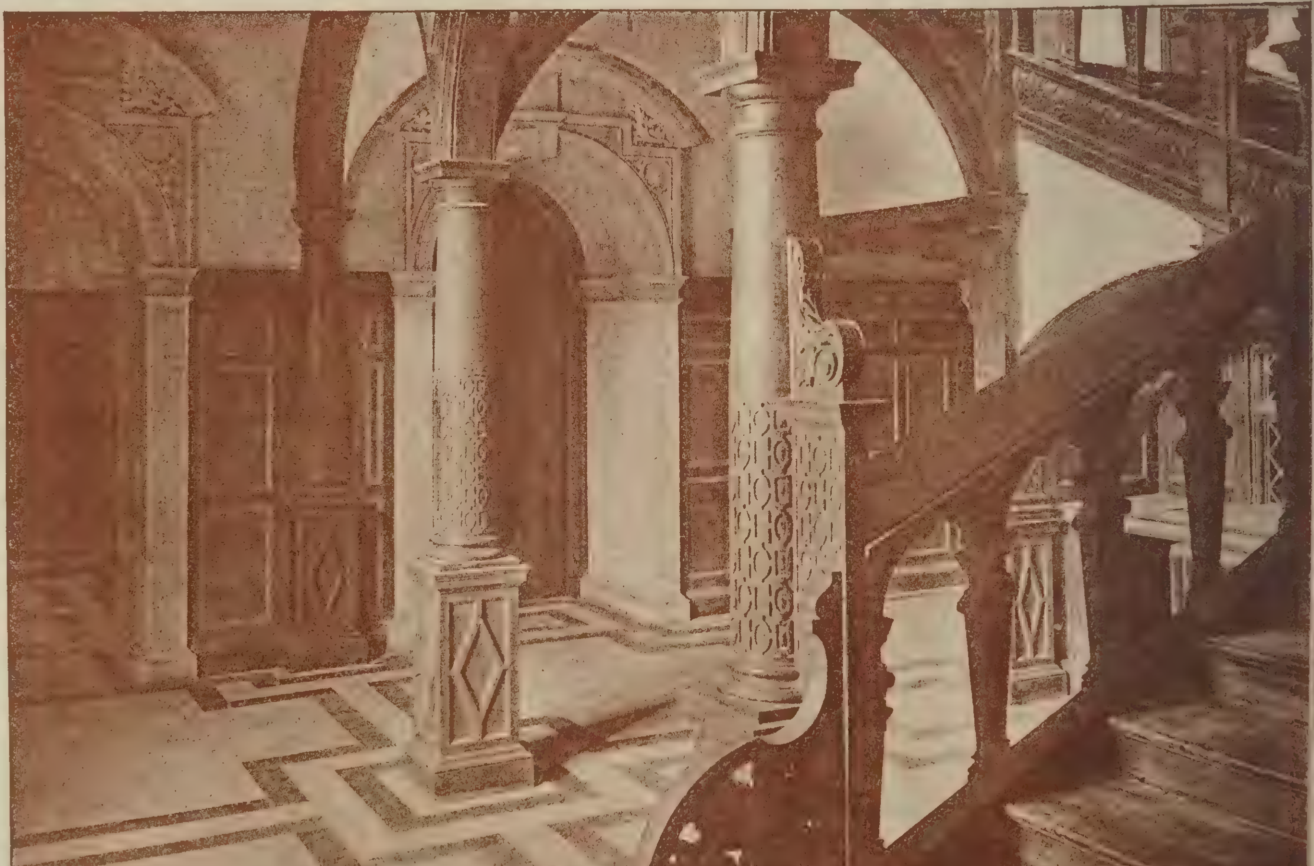

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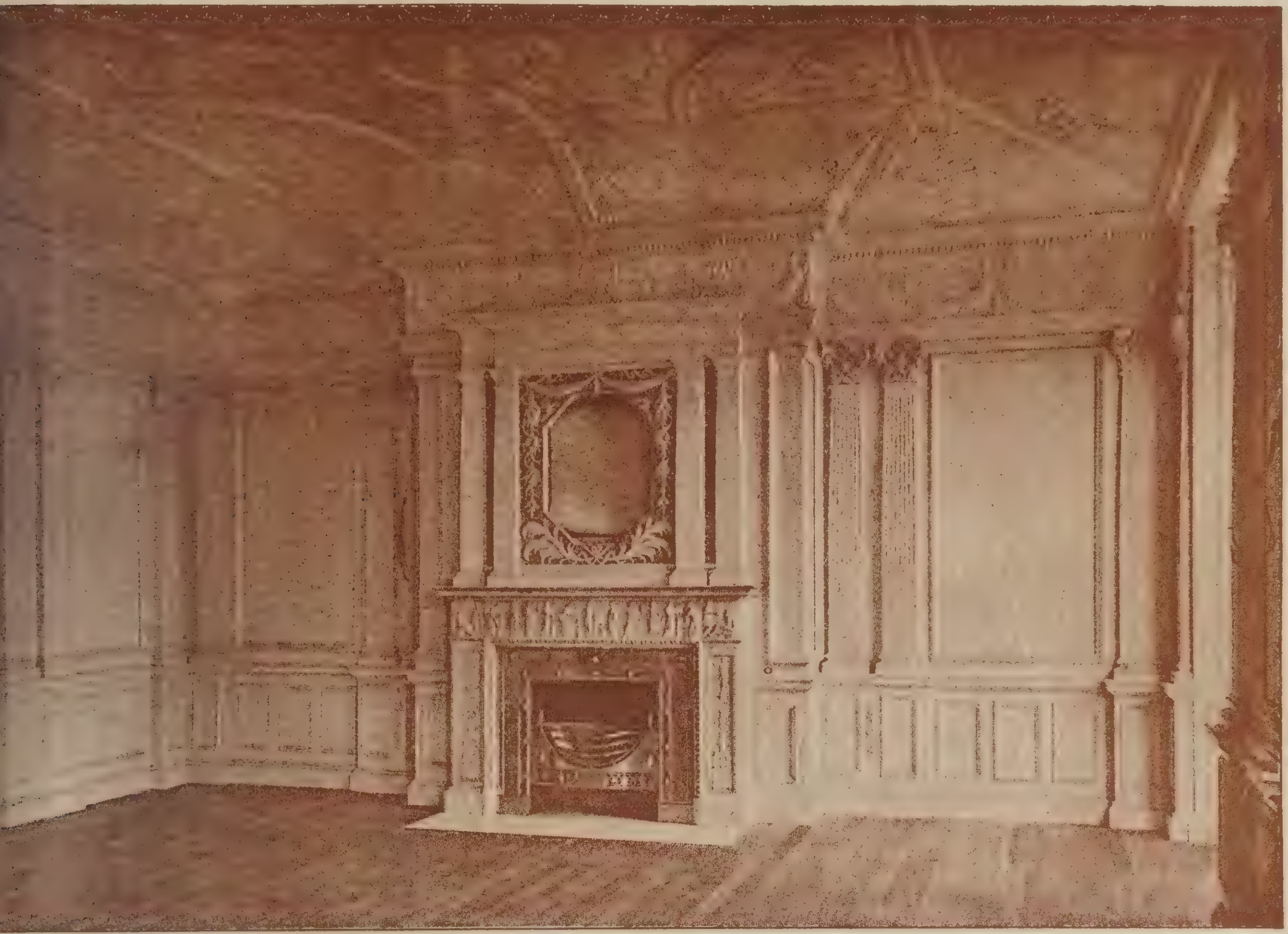
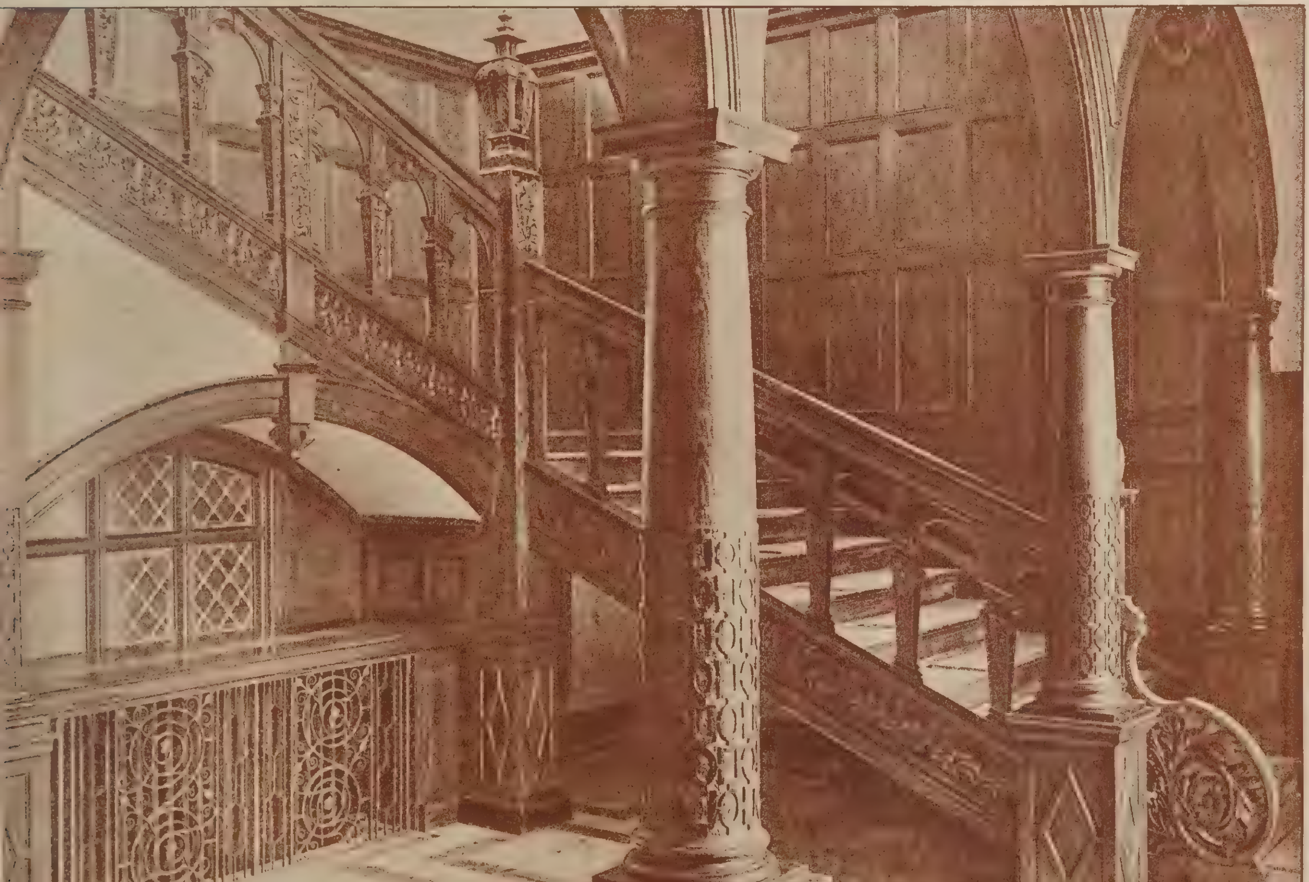
Mr. T. G. JAKS





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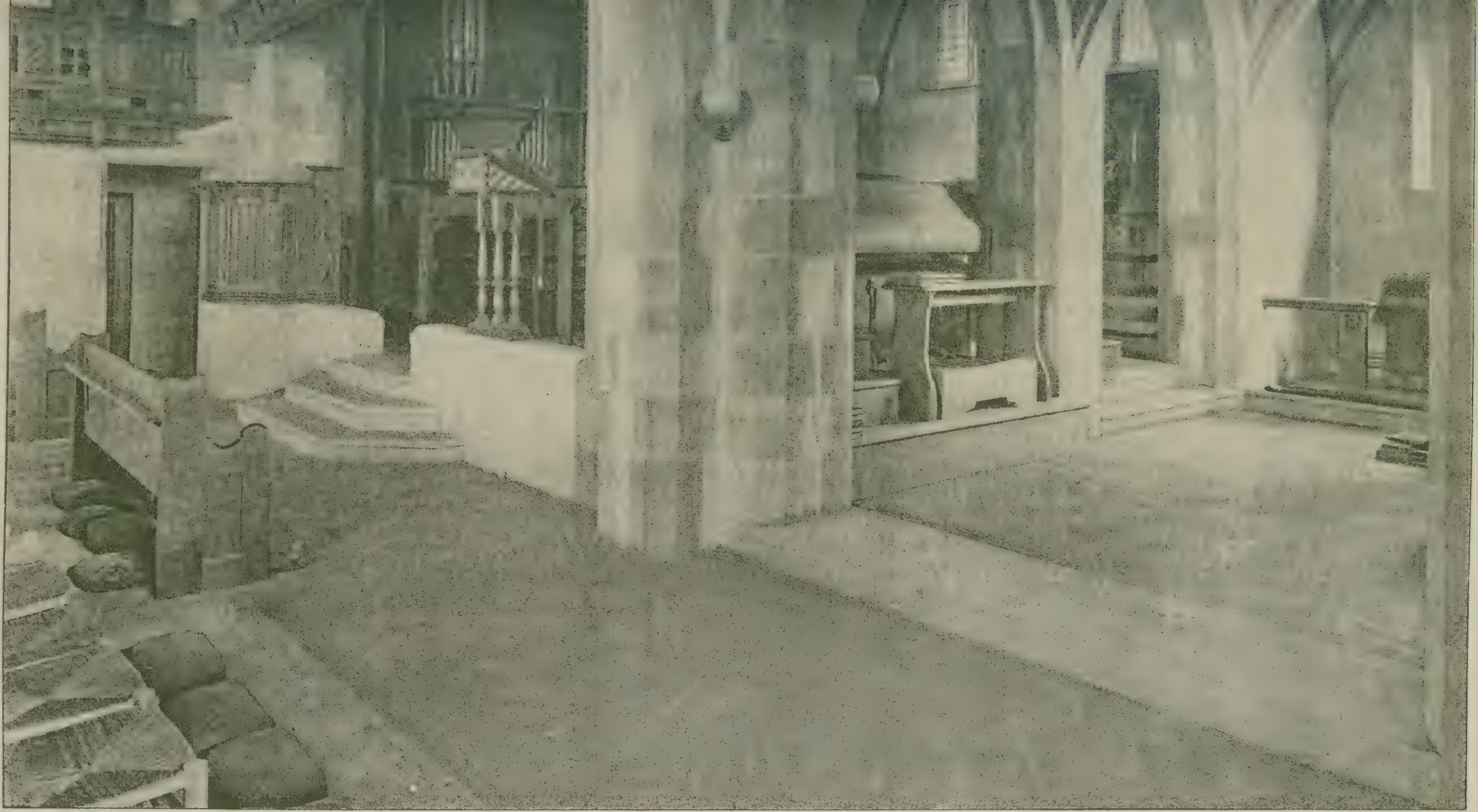
R.A., Architect.



T. LEWIS, PHOTOGRAPHER BIRMINGHAM.

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INTERIOR OF DODFORD CHURCH: THE TRANSEPT AND SIDE CHAPEL.

Mr. ARTHUR BARTLETT, F.R.I.B.A., Architect.

# The Architect.

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## FORTHCOMING EVENTS.

*Monday, March* 14.

Royal Institute of British Architects : Paper on "The Business Side of Architecture," by Mr. A. A. Hudson, H.A., Barrister-at-Law.

Royal Society of Arts : Cantor Lecture II., on "Lead Work," by Mr. Lawrence Weaver, F.S.A.

*Wednesday, March* 16.

Carpenters' Company : Paper on "Mural Painting," by Professor G. E. Moira.

Manchester Society of Architects : Paper on "English Castle Building," by Mr. J. T. Halliday, A.R.I.B.A.

Northern Architectural Association : Annual Meeting and Prize Distribution.

*Thursday, March* 17.

Royal Institution of Great Britain : Lecture on "Turner," by Mr. A. J. Finberg.

Concrete Institute : Paper on "Notes on the Chatelier Boiling Test," by Mr. D. B. Butler.

*Friday, March* 18.

Architectural Association : Paper on "Filippo Brunelleschi and the Renaissance," by Professor Beresford Pite (Nomination of Officers).

## THE PROTECTION OF ANCIENT MONUMENTS.

HIS MAJESTY'S Commissioners of Works are empowered by the Ancient Monuments Protection Act, 1882, to accept the guardianship of "any ancient monument to which this Act applies" when constituted guardians by deed under the hand of the owner.

This power of guardianship remains with the Commissioners under the Act of 1882 until revoked by a succeeding owner not bound by the original deed, but the guardianship does not necessarily debar the owner or his successors in title from exercising any of his or their rights in the property of the ancient monument, which they can accordingly sell or otherwise alienate, save that the owner as well as the general public is prohibited from committing any injury or defacement of the monument.

The Act of 1882 also provides that an owner of an ancient monument may by deed or will give, devise, or bequeath to the Commissioners his property in any ancient monument to which the Act applies, and the Commissioners may, if they think fit, accept the property.

The Act of 1882 also permits the Commissioners to purchase for the nation any ancient monument on terms mutually agreed between the owner and themselves. The Commissioners may thus become either guardians only or both owners and guardians of any ancient monument "to which this Act applies."

By this Act, therefore, we have a recognition of the principle that the preservation and protection of ancient monuments is a national affair, and that the nation at large should be prepared to relieve from the cost of maintenance those who for the moment may happen to be the private owners of monuments in which the whole nation has an interest.

At the time that this Act of 1882 was passed it was not, however, recognised that any monument was worthy of national regard that was not so ancient as to be pre-historic, and a schedule of such monuments was appended to the Act as those "to which this Act applies." This schedule gives a list of twenty-nine ancient monuments in England and Wales, twenty-one in Scotland, and eighteen in Ireland, all of which are of the nature of tumuli, barrows, forts, and camps, or early stone monuments of pre-historic date.

The Act provides for an extension of the schedule by giving power to the Crown by an Order in Council to declare that other monuments shall be deemed to be ancient monuments "to which this Act applies," but unfortunately limits the selection to monuments "of a like character" to those in the schedule.

The limitation of the Act of 1882 has, therefore, with the growth of interest in national monuments, led to amendments, the latest of which is expressed in a short Bill, introduced into the present Parliament by Mr. L. Harcourt, the First Commissioner of Works, and read for the second time on Friday last.

An explanatory memorandum is attached to the Bill, which reads:—"Power is given by Section 4 of the Ancient Monuments Protection Act, 1882, for any person to bequeath to the Commissioners of Works any ancient monument to which that Act applies, and to the Commissioners of Works to accept any such bequest, if they think it expedient to do so. The ancient monuments to which the Act of 1882 applies are the monuments described in the schedule to that Act, and any other monuments of a like character indicated from time to time by Order in Council. The monuments described in the schedule to the Act are such that it is impossible to include as monuments to which the Act applies any ruined buildings of historical or architectural interest. Inconvenience has arisen in practice as a consequence of this limitation, and, to remedy this, the Bill extends the provisions of Section 4 of the Act of 1882 to all monuments within the meaning of the Ancient Monuments Protection Act, 1900, that is to say, to any structures, erections, or monuments of historic or architectural interest or any remains thereof."

The Ancient Monuments Protection Act, 1900, to which reference is made in this memorandum, established a further important principle, that ancient monuments worthy of national concern embrace not only prehistoric remains, but any monument that "is a matter of public interest by reason of the historic, traditional, or artistic interest attaching thereto."

The Act of 1900, therefore, makes the great advance that the historic or artistic interest of works of architecture entitles them to the protection afforded to ancient monuments as much as mere archæological or antiquarian interest.

The amending Act of 1900 also extends to the Council of any county some of the powers given to the Commissioners of Works, so that a County Council may also become either guardian or, by purchase, owner of any ancient monument. The ownership or guardianship may also be transferred from a County Council to the Commissioners, or *vice versa* from the Commissioners to a County Council.

It is not necessary under the widened scope of the Act of 1900 that an ancient monument shall be in ruins and even uninhabitable so long as it is not "occupied as a dwelling place by any person other than a person employed as a caretaker thereof, and his family."

The Bill now before Parliament is intended to remedy an oversight in the Act of 1900, which though extending the category of ancient monuments, omitted to give the Commissioners of Works or a County Council power to accept as a bequest by will any monument within the extended category. This, the First Commissioner of Works explained in moving the second reading, placed him in a difficulty with regard to the desire of an owner, nameless for the present, to bequeath to the nation what Mr. Harcourt described as "one of the finest historical monuments in the country."

Curiosity has naturally been aroused by the mystery that at present it is obviously undesirable to remove, and Richmond Castle, Yorkshire, Stonehenge, and Battle Abbey have all been suggested as the monument to which Mr. Harcourt alluded. The list of surmises might easily be enlarged to quite formidable dimensions.

It is gratifying to know that the importance to the nation of a careful preservation of ancient monuments is receiving due consideration, and that there are at present three separate Royal Commissions engaged in inquiry into the question, one Commission being appointed for England, another for Scotland, and the third for Wales. When the labours of these Commissions are completed, we shall expect to be in possession of a complete inventory of those monuments, both prehistoric and historic, that are worthy of being included as ancient monuments for the protection of which the nation should be prepared to undertake the guardianship.

It appears to us that Mr. Harcourt's Bill is capable of a still further improvement.

As the law stands at present the Commissioners of Works may, under the Act of 1882, become owners of a pre-historic monument by gift or purchase from an owner during his lifetime or by bequest at his death.

The Act of 1900 empowers the Commissioners to become owners of a monument not pre-historic either by gift or purchase from an owner during his lifetime, but not by bequest, whilst a County Council may become owner by purchase.

Mr. Harcourt's Bill proposes to allow the Commissioners to accept the bequest of ancient monuments not pre-historic, and they will thus be in a position to become owners by gift, purchase, or bequest of "any structure, erection, or monument of historic or architectural interest or any remains thereof," as well as of pre-historic monuments.

But the County Councils will still remain under the disability that at present fetters the Commissioners of Works, and we would suggest that they also may be empowered to accept bequests or gifts instead of being limited as at present by the Act of 1900 to acquisition by purchase.

Pride in and affection for one's own county are sentiments that are deeply rooted in many Britons of the present day, and there are numerous influences in our modern life that tend to strengthen and develope this spirit of clan. The principle having been adopted that it is desirable that ancient monuments should be protected at the public expense, it seems to us that owners of such monuments should be permitted to give or bequeath them to the representatives of their county as well as to the representatives of the nation.

## NOTES AND COMMENTS.

Although the number of workers in the Students' Sketching and Measuring Club has not been quite so large in February as in January, we are glad to have received fifteen sets of measured drawings, the quality of which is of a very high grade. We hope to give a criticism of the drawings and announce the winner of the monthly prize next week.

Mr. W. H. Lever has made a handsome gift to Liverpool University out of the sum of 91,000*l.* received in damages as the result of the successful libel actions of Messrs. Lever Brothers against various newspapers. The sum of 24,000*l.* is offered by Mr. Lever should the University care to exercise the option they have acquirec of purchasing the old Bluecoat School. If the building is not found suitable, then Mr. Lever will give the money for the erection of a building adjoining the University fo the accommodation of the School of Architecture and its subsidiary, the School of Civic Design. Mr. Lever alsc gives to the University 60,000*l.* worth of shares in the Bromboro' Port Estate Company for the benefit of the School of Civic Design, the School of Tropical Medicine and the School of Russian Studies. As these shares although ultimately expected to become very valuable do not at present pay a dividend, Mr. Lever in the meantime guarantees to pay 3 per cent. on the 60,000*l* for the benefit of these Schools of the University.

The discontent which is felt by many for the proposed plans of the new abattoirs at Belfast has founc expression in a trenchant letter from Mr. Jas. J. Phillips to the *Belfast News-Letter* as a final protest against the scheme that the Belfast Corporation seem bent on carrying into execution. The main objections seem sufficiently serious, first, that the cooling chamber is placec over a brick-built main sewer, 5 feet 3 inches diameter which for some part of its length, if not on the actua site of the abattoirs, has been found defective; second that the meat hall is to be surrounded by the lairages and so continually exposed to the risk of taint anc infection.

At Darlington the architects of the town feel aggrievec because a Mr. Pallister, an official of the Rural Distric Council, has been appointed as architect for an extension of the workhouse for the Board of Guardians, anc a letter of protest has been received and discussed at recent meeting of the Guardians. Although a large minority were in sympathy with the protest, the lette was ordered to lie on the table. We have before repeatedly expressed our opinion on the manner in whicl architectural work is given by local bodies to officials often appointed for quite other duties to which thei whole time is supposed to be devoted. The plea o cheapness which is generally advanced for this procedur is quite fallacious nine times out of ten, and the fees o a properly qualified and independent architect would b covered many times over by the greater economy of th work and the better value for money that would b obtained.

Truro Cathedral has received the peal of ten bells which are now being hung in the Queen Alexandra o north-western tower. Each of the bells bears a Latii inscription quoting the first words of some one of th Canticles, the name of the saint or saints to whom th bell is dedicated, the name of the donor and the date The weight of the bells, together with the names of th donors and price, is as follows:—

No. 1.—6 cwt. 2 qr., children of the diocese, 40*l.* 19*s.*
No. 2.—7 cwt., Mr. J. C. Daubuz, 44*l.* 2*s.*
No. 3.—7 cwt. 3 qr., the late Major Parkyn, 48*l.* 16*s.* 6*d*
No. 4.—8 cwt. 1 qr., Mr. A. P. Nix, 51*l.* 19*s.* 6*d.*
No. 5.—9 cwt. 2 qr., anonymous, 56*l.* 14*s.*
No. 6.—11 cwt. 2 qr., Mrs. Moor (St. Clement's), 72*l.* 9*s*
No. 7.—16 cwt., Mr. and Mrs. John James, 100*l.* 16*s.*
No. 8.—19 cwt., Mr. S. M. Robins, 119*l.* 14*s.*
No. 9.—25 cwt., the Bolitho family, 157*l.* 10*s.*
No. 10.—35 cwt., Mrs. Hawkins, 220*l.* 10*s.*

Sheffield, notorious for its murk and grime, is i hopes of being able by the adoption of the Town Plannin Act to receive a belt of suburbs healthful and health giving, and the members of its Town Council appear t be carefully studying the best means by which thi desideratum can be obtained.

Mr. W. H. Bidlake, M.A., F.R.I.B.A., in a lectur delivered to the Workers' Educational League at Birmingham, on "Birmingham as it Might Be," well expresse what we consider to be the primary considerations of town-planning scheme when he explained that there wer two main systems on which a town might be laid out

There was, first, the "chessboard" system, in which all the streets were set out at right angles each to the other; and, secondly, the "spider's web" system, in which the streets were either radial or concentric. The "chessboard" system had been practised at all times from the earliest ages. The system had one merit, the square blocks suited the natural shape of the buildings. That was all that could be advanced in favour of it; it was mechanical and soulless in the extreme. The "spider's web" system was more in harmony with the natural growth of the town. Moreover, it allowed of a focus which the former system did not. Birmingham itself had developed very much on these lines. But the setting out of a town on rigid radial or concentric lines, with the public buildings in the centre, was only a little less objectionable than the rectangular system. Both were alike artificial, and wanted individual expression. Further, the radial system, if strictly carried out, as some had advocated, gave awkward triangular sites ill-adapted to buildings, and while the straight radial streets gave monotonous and interminable perspective, the perspective of the circular ones was for ever opening out, and yet for ever closed. The ideal, said Mr. Bidlake, was to be found neither in the one system nor the other, but, as was so often the case, in the middle way, for while the principal public buildings and their surrounding squares and places would certainly form the principal focus, the railway station, harbour, and river bridge would assuredly form other foci, and from each radial roads would lead. If, therefore, the main thoroughfares were mostly radial, the filling in of secondary roads should be approximately rectangular to suit the buildings, and, in addition to these, one or more main concentric roads should bind the whole together, while judiciously disposed diagonal roads should here and there unite points of special importance, but above all and beyond all the lay-out should adapt itself to the natural topographical conditions, its roads gently curving here round contour lines or river bend, or there striking out straight across to the plain. Only thus by frankly accepting the bent of the site would the town acquire a natural and individual character. Almost all mediæval towns had developed thus, and it was to this fact that much of their charm was due. Following his enunciation of general principles, Mr. Bidlake dealt in detail with the modifications of Birmingham's plan in a quite reasonable and admirable scheme. This is what we call the practical and sensible exposition of town planning, which is far more valuable in the education of the public than any amount of resolutions and vague generalities.

## CHURCHES AND CLOISTERS IN PORTUGAL.*

In the autumn of last year I paid a visit to Portugal. My tour was rapid and cursory, yet it opened my eyes to the fact that Portugal possesses architectural remains of which we in England know little or nothing.

This is rather surprising when we consider that nationally Portugal is our oldest ally, that the country is comparatively near to our shores, that English trade with it was reciprocal as far back as six centuries ago, and that 100 years ago its armies fought side by side with ours in the Peninsular War. A century and a half ago Henry Fielding the novelist voyaged to Lisbon in search of health, too late to find it, and died there. Between 1792 and 1795 James Murphy published a folio volume with plates illustrating Batalha Abbey. William Beckford, the author of "Vathek," visited the abbeys of Alcobaca and Batalha in 1794 and published an account of his visit, but somehow or other during recent generations Portugal has been more or less overlooked by Englishmen so far as its architecture is concerned.

In 1865 the Hon. Secretary for Foreign Correspondence of the R.I.B.A. communicated to a general meeting some notes in which he said:—"Anything respecting Portuguese architecture must, I think, be acceptable. With the exception of a monograph or so our stock of information is but scant. Gwilt in his Encyclopædia gives a chapter on Spanish and Portuguese architecture, in which the latter is conspicuous as one of our statesmen once expressed himself, by reason of its absence."

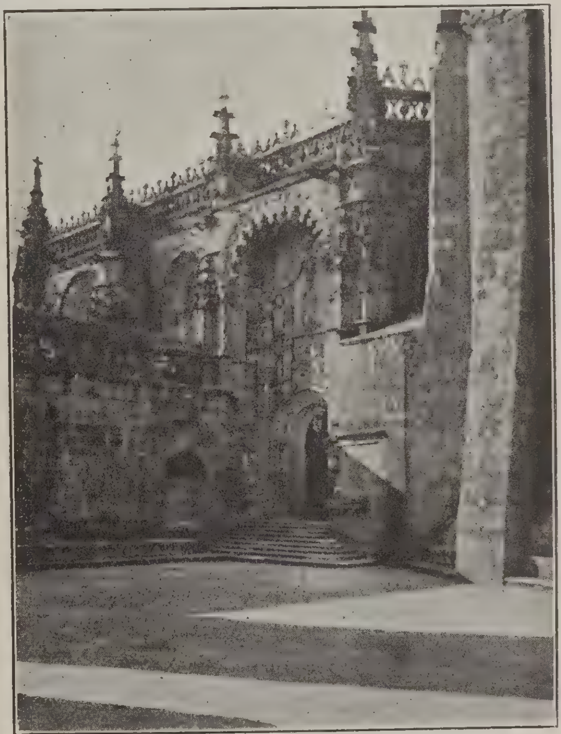
The Secretary had overlooked Gwilt's chapter on "Pointed Architecture," at the end of which he refers to and illustrates the abbey church of Batalha, giving some quite inaccurate information about it.

A later edition by Papworth mentions a few other Portuguese buildings.

Fletcher passes Portugal over without a word, except in connection with Rosslyn Chapel, near Edinburgh, where he says, "Portuguese influence is apparent, for it is very similar in detail to the church of Belem." The latter is however fifty years later.

Fergusson devotes three or four pages to Portugal, and illustrates the south door of Belem as a frontispiece to one of his volumes, and apparently provides Fletcher with the Rosslyn-Belem theory of common origin for both.

I have never seen Rosslyn, although I have made several attempts to do so, but judging from illustrations I can see no analogy between it and Portuguese work except in the overcrowded ornamentation. My impression is that the work at Rosslyn is coarse, whereas Portuguese work is not so. MacGibbon and Ross describe much of the detail at Rosslyn as "rude and debased," and say "no parallel to Rosslyn has, so far as we know, been discovered abroad." I find, however, that Mr. H. W. Brewer, in a paper read before the R.I.B.A. on April 21, 1873, on "The Churches of Brittany (North Coast)" says:—"At Plougasnou there is a church with a small transeptal chapel opening out of the south aisle, which bears so remarkable a resemblance to some portions of Rosslyn Chapel that I am led to believe that it must be by the same architect . . . in fact so great is the similarity that I feel convinced they had some common origin." However, all this is obiter, and let us return to our subject.



SOUTH PORTAL, THOMAR.

As far as my knowledge extends the only English book upon Portuguese architecture is but two years old, by Mr. Walter Crum Watson, architect, of Edinburgh, to which I am indebted for much of the information I am able to lay before you. He also read a paper before the Edinburgh Architectural Association on January 16, 1904, afterwards published in the R.I.B.A. *Journal* for that year.

Mr. Watson in the list of authorities he had consulted mentions only one English book on the subject, namely, Murphy's book already referred to. Murphy's drawings with all their poverty of execution and inaccuracies are wonderfully good for their date. The story of his book is rather interesting. James Murphy was a Dublin architect (born 1760, died 1814). The "Dictionary of National Biography" says he was originally a bricklayer, but his book is written in the language of a well educated man. In the year 1789, at the age of twenty-nine, he was commissioned by the Right Hon. Wm. Conyngham to go to Batalha (which that gentleman had visited in 1783), and to make measured drawings of the abbey. Murphy says he spent thirteen weeks there, and the result was his book, containing twenty-seven large plates, published, he states, at the expense of Conyngham, at a cost of upwards of 1,000*l.*; not a bad record, I think, for a private gentleman of antiquarian tastes 120 years ago, in what we are apt to consider the unenlightened reign of George III.

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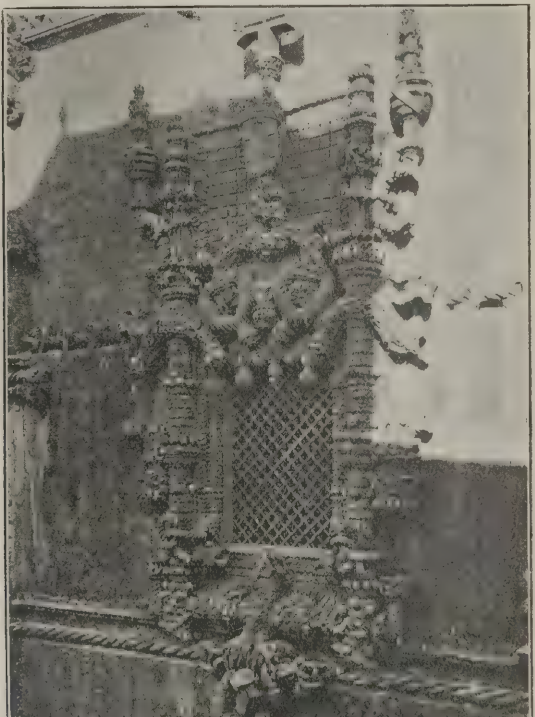
* A paper read before the Northern Architectural Association on March 2, by Mr. Joseph Oswald, F.R.I.B.A.

I am not going to hold up Portuguese architecture to you as an example to be followed, but, however unimportant it may be in the history of our art, to ignore it would be to seal up a chapter in that history, and so I make no apology for asking you to give some attention to it to-night.

We shall find it (when compared with English, French or Italian work) generally clumsy in bulk and outline, and to our eyes impure and unduly florid in details; but on the whole delicate and dexterous in the manipulation of such details. Whether the over-elaboration of detail is due to Moorish tradition or Indian influence has been much discussed. Dr. Carotti in his "History of Art" says:—"In Portugal the development of art was parallel to, though more modest than in Spain. But when, towards the end of the fourteenth century, Portugal made itself politically independent of Spain, a new style of decoration began to arise similar in character, but even richer and more inventive, a true national style. It was in this magnificent style, compact of Gothic and Moorish (the latter element prevailing even more than in Spain) and elements of Italian Renaissance, that was fashioned the fantastic and marvellous monastery of Belem."

We cannot study the architecture of any country or district properly unless we know something of its history. A brief glance at so much of this as leads up to, and is contemporaneous with, our architectural survey will therefore help us on our way. But to begin with we must not forget that Portugal is quite a small country, about 340 miles long and 100 miles wide, its area being about 34,600 square miles, or about two-thirds of the area of England (without Wales or Scotland).

The ubiquitous Romans occupied the country (Lusitania) from 139 B.C. to about 400 A.D. On their withdrawal, Goths and Visigoths from the north overran the peninsula, which was conquered by the Moors in 711, and they were not completely driven out for many centuries after, although revolts against them took place frequently after 997, at which date they ceased to hold the north of the country but retained more or less authority over the extreme south for 300 years afterwards.

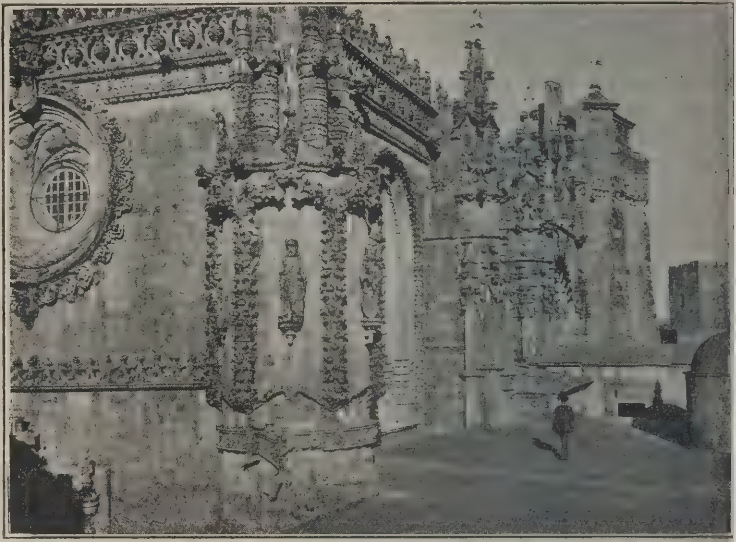


CHAPTER-HOUSE WINDOW, THOMAR.

In 1140 Alfonso Henriques, by the aid of English and other Crusaders, founded the first real kingdom of Portugal, and fighting went on between it and the Moors on one hand, and the adjoining kingdom of Castile on the other, until in 1273 under Alfonso III. (being the fifth king), practically the whole of the present territory was acquired.

This king was succeeded by Diniz in 1279, who contracted in 1294 a commercial treaty with England, then ruled by Edward I. This treaty was reaffirmed in 1353 by our Edward II. Pedro I. (the Great) whose tomb and effigy we shall see at Alcobaca, reigned from 1357 to 1369.

His successor (Ferdinand the Handsome) became involved in war with Castile, which our English John of Gaunt claimed for his wife, who was a daughter of the King of Castile (Pedro the Cruel). Ferdinand's widow assumed the Regency, but her conduct caused a revolution, and John I. (the Great) became king, and assisted by John of Gaunt gained the great victory of Aljubarotto over Castile on August 14, 1385, to the commemoration of which Batalha Abbey owes its existence.



THOMAR, FROM SOUTH-WEST.

The following year (1386) witnessed the marriage of John of Gaunt's daughter, Philippa, to King John I., and of another daughter (the father seems to have been a diplomatic old match maker) to the heir to the throne of Castile. These relationships stopped for the time the rivalry between the two countries. The same year was signed the treaty of Windsor declaring that England and Portugal were united in friendship, and our then King Richard II. created John I. Knight of the Garter, and this distinction has been conferred upon most of the kings of Portugal ever since. The intimate connection between England and Portugal at this time may account for some of the features in Batalha Abbey.

The third son of John I. and Philippa was Henry, called "the Navigator," on account of the encouragement he gave to maritime enterprise by his countrymen, which culminated a century later, during the reign of John II. and Manuel the Fortunate, when Bartholomew Diaz first rounded the Cape in 1486, and Vasco de Gama reached India in 1498, and Brazil was discovered in 1501; Sumatra and China were afterwards reached, and Madagascar and Mauritius explored, bringing untold wealth to Portugal in the reign of Manuel, which lasted from 1495 to 1521, and whose taste for the florid in architecture we shall see exemplified later on in the so-called Manueline style, which appears to be the most distinctively characteristic phase of Portuguese work.

The enormous accession of wealth just referred to unfortunately resulted in corruption in high places, and national decay set in during the reign of John III. between 1521 and 1557.

In the early part of the reign of his successor Sebastian was erected the latest of the examples we shall see to-night (the Renaissance cloister at Thomar), and therefore we will not pursue the historical side of our subject further in detail. Suffice it to say that in 1580, at this very place Thomar, King Philip II. of Spain was crowned King of Portugal, and then followed sixty years of Spanish rule under which Portugal was in subjection to her neighbour, and nearly all her vast possessions in the east were wrested from her, although she retained Brazil. After sixty years she revolted against Spain, but did not recover her independence until 1668, just before which (in 1662) King Charles II. of England married to her sorrow a Portuguese princess, Catherine of Braganza. After her miserable married life and long widowhood she lies at rest in the church of Belem.

Subsequently Portugal was again at war with Spain between 1706 and 1715. This brings us to the eighteenth century, marked by the terrible earthquake at Lisbon in 1755. The early years of the nineteenth century brought the struggle against France, which we call the Peninsular War, after which there were internal dissensions and civil war until 1834.

To a casual visitor like myself the country now seems settled and prosperous, and the population contented.

Although I visited other buildings interesting to architects, I am going to confine myself to-night almost exclusively to the monasteries or convents of Thomar, Alcobaça, Batalha and Belem. The first three all lie within about twenty-five miles of each other, sixty miles north of Lisbon, and 100 miles south of Oporto. The last, Belem, is close to Lisbon.

In 1834 the monasteries in Portugal were suppressed by the Government, but their churches were not desecrated, and are retained as so-called national monuments, well cared for and kept in good condition. The domestic buildings are devoted to secular purposes; at Thomar and Alcobaca they are used as barracks for soldiers, at Belem as a boys' orphanage.

*Thomar.*

Above the plain on which now stands the pleasant little town of Thomar rises a steep hill, on the summit of which and in close contiguity to their fortress the Knights Templars in 1162 began to build their "round" church, consisting of a polygon of sixteen sides, encasing an octagon. This octagon has two tiers of slightly pointed arches, and is surrounded by a barrel vaulted ambulatory. The interior is dimly lit by round-headed windows high up in the external wall of the polygon, which has massive battering buttresses.

In 1319 the Knights Templars had ceased to exist under that name, but were transformed, so to speak, into a new military order, the "Order of Christ." Prince Henry the Navigator was in his time the Grand Master of the Order (1417-60), and he threw out the small eastern chapels and built two cloisters to the north-east of the round church. The eastern cloister is now ruined, but the other "the Cemetery cloister," is in excellent preservation. It has a dado of beautiful glazed tiles, and contains a gruesome sight in a stone tomb in a recess of the southern walk, having a coped top in which is a glass panel, through which you can look down into the tomb and see the mummified corpse of Balthasar de Faria, a great courtier of Philip II. of Spain, instrumental in forcing the Inquisition upon Portugal, and so bitterly detested that, it was said, the earth itself refused to receive or cover his remains.

CLOISTER OF THE PHILIPS, THOMAR.

The Order of Christ increasing in power and wealth, it was decided in 1492, when King Manuel was its Grand Master, to build a larger church.

Instead of tacking this on to the east end of the old round church as was done in England at the Temple Church in London, and at the round churches at Northampton and Cambridge, they here joined their new building on to the west side of the polygon, so that it forms what we would call the nave, but is in fact called the "coro." It is 85 feet long by 30 feet wide inside. The two western sides of the polygon were taken out, and a large pointed arch inserted to open out the polygon towards the new coro, which is of three bays. Of these the two western bays are as to the lower part occupied by the chapter-house, above which is the raised choir, similar to that which we will see later at Belem. At this time also the simplicity of the old round church was considerably interfered with, to suit the taste of the time, by the introduction of crocketted canopy work for statues, also by painting, gilding and pictures, some of which still remain. The fine choir stalls and fittings were unfortunately burnt by the French during the Peninsular War, so that the present aspect of the western limb is bare.

CHURCH OF ST. JOHN BAPTIST, THOMAR.

The general view from the south-west exemplifies the clumsiness of form to which I have referred and shows the extraordinary treatment of the buttresses, especially at the angles of the west front.

The south portal, which occupies the new bay immediately west of the old round church, is a good deal later in date than 1492, when the decision to enlarge the church was come to. It may be that like many architectural schemes we wot of, the execution was long delayed, or it may be that the carving was left till nearly the last, for it is said to be dated 1515, and may be later still by ten years or so. Be that as it may it cannot be denied that the portal is a very fine example of the Manueline style, exhibiting a mixture of Renaissance and Gothic details, but less exuberant than the portals of Belem, which we will come to later. A charming effect is due to the deep shadow cast by the foliated curtain arch thrown across the bay from buttress to buttress. Above the door we see the armillary sphere used by King Manuel as a sort of badge emblematic of the almost world-wide discoveries made in his reign. It appears in every building with which he had to do.

The other great feature of the church is the chapter-house window at the west end. Of this the Portuguese are very proud, but I fear we can only regard it as an extravaganza. The theory has been advanced that the Portuguese architects and sculptors were at that time influenced by the discovery of India having revealed to them the intricacies and elaboration of Indian design and workmanship. Be that as it may, we have here coral branches, ropes, leaves, pinnacles and armillary spheres, carved with wonderful manual dexterity, surmounted by the Cross of the Order, below which is the Royal coat of arms. At the bottom of the composition is the carved head of a man, traditionally that of the sculptor.

The buttresses at the angles of the west front are also elaborately treated in similar fashion to the window; that at the south-west corner has a strap and buckle, said to be that of the English Order of the Garter, of which King Manuel was a Knight. High up in the gable is a round window lighting into the coro above the chapter-house with curious ornamentation, said to represent the sails of ships bound by ropes, indicative of the sea power and prowess of Portugal at that time. A redeeming feature of the design is the plain wall surface in which the windows are set. The whole is built of a warm yellow limestone of charming colour.

In 1524 King John III. changed the Order of Christ from a military order into one of monks, and built for them to the north, south and west of the church a set of five cloisters, with cells, dormitories, and refectory.

In 1557 the south-eastern one (now called the Cloister of the Philips), if ever it had been finished, was pulled down and rebuilt during the next five years in a pure Renaissance style. It is about 115 feet square, with a fine central fountain. It is a very successful composition, well balanced with good details. Unlike our English cloisters it is two storeys in height, and its combination of round and square-headed openings is very happy.

The cloister walks are as dignified, quiet and refined internally as externally.

The other cloisters are more or less ruined, and with the domestic buildings surrounding them are occupied as barracks. Their architecture is not equal to that of the other two cloisters. We have thus traced the history of this remarkable block of buildings for nearly four centuries. Afterwards little change appears to have taken place, except that the bell tower and gable now existing at the east end of the church look as if they were seventeenth-century work.

FOUNTAIN IN CLOISTER, ALCOBACA.

There are two other churches in Thomar. First, St. Mary of the Olives, a little way out of the town. It occupies the site of a church built by the Knights Templars before they built their church on the hill. The architecture looks as if it were of the early part of the thirteenth century, but may be later. The tower is quite detached to the west of the church. Second, St. John Baptist in the town. This is early Manueline work, 1494, with a fine west door, an interesting tower and spire, and a square topped west end.

*(To be concluded.)*

## SEVENTEENTH CENTURY HOUSES IN NORTHAMPTONSHIRE.*

*(Concluded from last week.)*

APETHORPE was already a large house when Sir Francis Fane came into possession. He either enlarged it or remodelled a considerable portion, and his work followed the prevalent style of the district, substantial and simple in its detail, yet withal picturesque. Bay windows help to gi the latter quality, so do stepped and curved gables ar quaint finials outlined against the sky. On the ground flo of his main wing, in which was the new entrance, introduced an open loggia, a feature which he copied fro Italy, as did many of his contemporaries. It is true th the same idea had prevailed in old times in the cloisters monasteries, but it was not suited to our English climat and later owners of these great houses, not being so we adapted to the simple life as were the monks, found the long open arcades chilly, and in most instances, as here Apethorpe, they have been enclosed and converted in dwelling-rooms. In addition to his new buildings, S Francis added parapets and curved gables to the existi walls, thus bringing the whole into harmony and bestowi piquant touches on the old Tudor work, such as may seen in the picturesque corner where the doorway to t original hall stands.

On the upper floor of his new wing, over the open loggi he contrived his long gallery, that characteristic feature every mansion of the time. The length of these galleri was extraordinary in proportion to their width, sometim being over 200 feet to a width of 20 or 25 feet. Here it 108 feet by 20 feet. The question has often been asked, what use were these rooms put? An answer is given at Ap thorpe in the inscription over the fireplace: it was intend for music. But from other sources we gather that lo galleries were often intended for exercise.

The pedantry which marks much of the literature of t period found expression in its architecture also, and S Francis indulged in the prevalent taste for allegories some of his chimney-pieces, which were the ordinary vehic for such fancies. In one room is set forth the union of i compatibles. War with her sword is about to kiss Pea with her olive branch; the lion and the lamb lie in o corner, while in another a child plays with a cockatri This room, as well as others, has a fine ceiling; the mid part is domed, and in the centre of the dome is a handso piece of modelled heraldry, the arms of James I. It w quite customary to place the royal arms, whether of Eliz beth in her time, or of James in his, in some conspicuo place; but here there was a special reason, inasmuch James had stayed in the old house on his way from Scotla in 1603; and during a later visit he had first met Geor Villiers, afterwards to become Duke of Buckingham.

Apethorpe is situated a few miles from Stamford, cl to which is the great house of Burghley, but Burghley its is outside the scope of our present inquiry, having be finished some years before the opening of the seventeen century. It had, however, a notable *dépendance* a mile so away called Wothorpe, a house built by the first E of Exeter, son of the great Lord Burghley. According old Thomas Fuller, he said he built it in order to be o of the dust while his great house of Burghley was a-sweepi but it may more correctly be regarded as the dower-hou the house to which the widow of a dead lord went when son came into possession. There is not much left of t original building, not much beyond the ruins of the centr block with its four towers. The detail here is not so quai and fanciful as in buildings of the former generation. shows a tendency towards the rather harder treatment whi an increasing acquaintance with "correct" architectu brought with it. But it still retains some of the atmosph of romance which envelopes the houses of the early part the century. When complete it must have been a nota building, although a pigmy in comparison with its par house, and it had what most of its contemporaries possessed a fine lay-out with terraces, terraced walls and alcoves. this splendour but little remains, the only substant remnant being a gateway, rather heavy in design, flanked either side by a pair of niches. Still the imagination ne not be very vivid to reconstruct, even if somewhat vague the gay parterres, the straight walks, the quaint statu the arcaded walls and the broad steps leading from o bright garden to another, which once existed.

If Wothorpe fails to create the picture, help may be h at Kirby, the most romantic of all the great houses of th time. The house as a whole must, for the same reas which affect Burghley, be excluded from consideration night; but its north court has two claims upon our atte tion. One is the arcaded wall enclosing it, which supp ments the glimpse of fine garden architecture which we at Wothorpe, and shows us other great archways with th niches. The other is the north front of the house itse An examination of this front reveals a noteworthy change architectural treatment. It is more formal, m "regular"—to use an epithet of the period—and windows are of an entirely new type. They are no longer divided into comparatively small oblongs by stone mullions, but consist of one large opening in which the glass is held by a wood frame. It was only a short step from such wood frames to sliding sashes, and the introduction of the sash window marks the definite change from the old traditions in design, which mingled Gothic ideas and Classic in a fascinating jumble, to the more correct and severe methods which a continuous study of Italian models had at length produced. The reason of the change at Kirby is that the owner, being anxious to bring his house up to date, employed Inigo Jones to impart a more fashionable air to it. Jones did this by introducing a few new windows in the walls of the main court, by refacing and remodelling this north front, and by various embellishments within the house, among which was a new ceiling to the porch, which follows lines entirely different from those adopted at Deene and Apethorpe some fifteen years earlier.

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* A lecture delivered by Mr. J. Alfred Gotch, F.S.A., F.R.I.B.A., on February 24 at Carpenters' Hall.

There is another house in the county to which Inigo Jones imparted a new character, and that is Castle Ashby, where he added a charming screen, quite Classic in its detail, and contrasting strongly with the somewhat earlier example which we saw at Rushton.

But Inigo Jones opened a new chapter in English architecture, of which we can only read these few lines to-night; however, they serve to show the end towards which all design had been drifting or, if you will, progressing during the early years of the century. This new chapter is a long one and no less interesting than its predecessors, but we must leave it and return for a moment, in conclusion, to the older manner, and to the matter from which Inigo Jones has caused a digression—the surroundings of great houses. Bacon in his essay on gardens shows us how lordly were some of the lay-outs of the time. His verbal description is borne out by such plans and surveys as have come down to us, notably by a plan of Wimbledon House, made in the year 1609, a house of which barely the memory even is locally preserved. It is, of course, impossible to show by photographs how gardens looked in the seventeenth century, but some idea of the spirit which inspired them may be gathered from an old house in the west of the county, Canons Ashby, the home of the Dryden family, of which the poet was a cadet. One of the adjuncts to nearly every house of the time was a courtyard, and this was entered either through a gatehouse, where the porter lived and perhaps the falconer and other outdoor servants, or else through a gateway. Small houses had such charming little entrances as that which still remains in the principal street of Oundle, giving access to some almshouses; and manor houses of intermediate size, such as Winwick, which is given in Norden's list as the home of Thomas Andrews, had gateways of more elaborate design, adorned, as might be expected, with the arms of the owner.

Looking back from the strenuous life which we now live, the early seventeenth century seems full of peaceful years—years when men could fleet the time carelessly, as they did in the golden age. But even to them there was a vast difference between the fever of the town and the repose of the country. Beaumont and Fletcher's "Noble Gentleman," when weary and harassed, yearned for his country home, where "quietly," as he said,

"Free from the clamour of the troubled court
We may enjoy our own green-shadow'd walks."

It was to such green shadow'd walks that such gateways as these gave access, and over them might fitly be written that line of Ovid's which surmounts the doorway of an ancient Northamptonshire hospital:—

"Time flows by, and we grow old with the silent years."

## LLANDAFF CATHEDRAL.*

By S. Bowen Williams, M.S.A.

*(Concluded.)*

THE tower on the north side has replaced an Early English structure, portions of the wall still existing being Early English. The present tower was erected by Jasper Tudor and is Perpendicular in style. The tower is not particularly beautiful, but presents many features worth notice. The buttresses do not reach the top of the tower, and the angle pinnacles of the parapet are therefore not supported by the buttresses as is usually the case. The elaborate parapet immediately catches the eye and strikes one as being too rich for the tower. Yet though this parapet is new it is practically a copy of the original parapet, and so Mr. Pritchard must not be blamed for it. There is a remarkable similarity between this parapet and that on St. John's Church, Cardiff.

One most pleasing feature of this tower is the manner in which the belfry windows are filled with ornamental pierced stonework instead of louvre boards as is usually the case. It is a great pity this practice has not been more frequently followed, for it is a great improvement.

The south-west tower and spire are entirely new and the work of Mr. Pritchard. The original Early English tower fell into ruins and had to be taken down. It is therefore by no means a restoration, and some critics have found fault with it on that score. But any such objection is easily silenced by the striking beauty and appositeness of the new erection. It is the first feature to strike the eye on approaching the cathedral, and nothing more exquisitely *à propos* could be imagined. The tower itself rises to about the same height as the north tower, and then the spire soars to a height of 195 feet. The whole composition is rather French in design, bearing a great resemblance to some spires in Normandy; and yet it harmonises well with the other work, and gives a charming finish to this part of the cathedral. The lower part of the tower is buttressed, and these buttresses terminate in canopies containing images of St. Peter, St. Paul, and Bishop Ollivant. One buttress has a bas-relief of the cathedral cut on one side. Over the roof of the south aisle are seated figures of the four Evangelists, and immediately above the tower changes from the oblong to the square shape. The spire itself, octagonal in form, rises gracefully from a machicolated cornice in a typically French manner. The angles of the spire are crocketted, but in general the work is not over-rich. It is very well proportioned and graceful, and reflects great credit on Mr. Pritchard.

Taken as a whole the composition of the west front balances exceedingly well, and though small is yet one of the most successful and picturesque in the country; and the addition of the spire adds a dignity and beauty which must have been lacking in the original building.

The next feature to be noticed is the chapter-house. It is much altered in appearance from the original. Mr. Pritchard took the liberty of ingeniously transforming the upper storey from a square to an octagon and surmounting it with a pyramidal roof. The effect is certainly striking, and the general appearance of this side of the cathedral is greatly improved by this arrangement, though its legitimacy may be questioned.

There remain the two Norman doorways in the north and south aisles. They are later work than the Norman arch over the presbytery, though they undoubtedly belong to Urban's church. The aisle walls were rebuilt during the Decorated period, and it is most probable that their position was altered. Both doors are richly moulded, and that on the south side has a Greek or Etruscan moulding as a label, very unusual in this style of work.

We have now finished most of the more noticeable features. A visitor might give a glance at the pierced parapet of the aisle walls, which is good work, and at the corbels beneath same, which are of interest as they are sculptured images of the Sovereigns of England from early times down to the present.

In conclusion we may refer to a few of the monuments.

In the Lady chapel there are the tombs of Bishops Coplestone, 1828-49, and William de Braose, who is supposed to have built this chapel.

On the south side of the presbytery is the supposed resting-place of St. Teilo, one of the founders; St. Dubricius is supposed to have been buried on the north side of the presbytery. His effigy is now in the north aisle.

The tomb of Sir David Mathew, standard-bearer of King Edward IV. at Towton, is at the east end of the north aisle.

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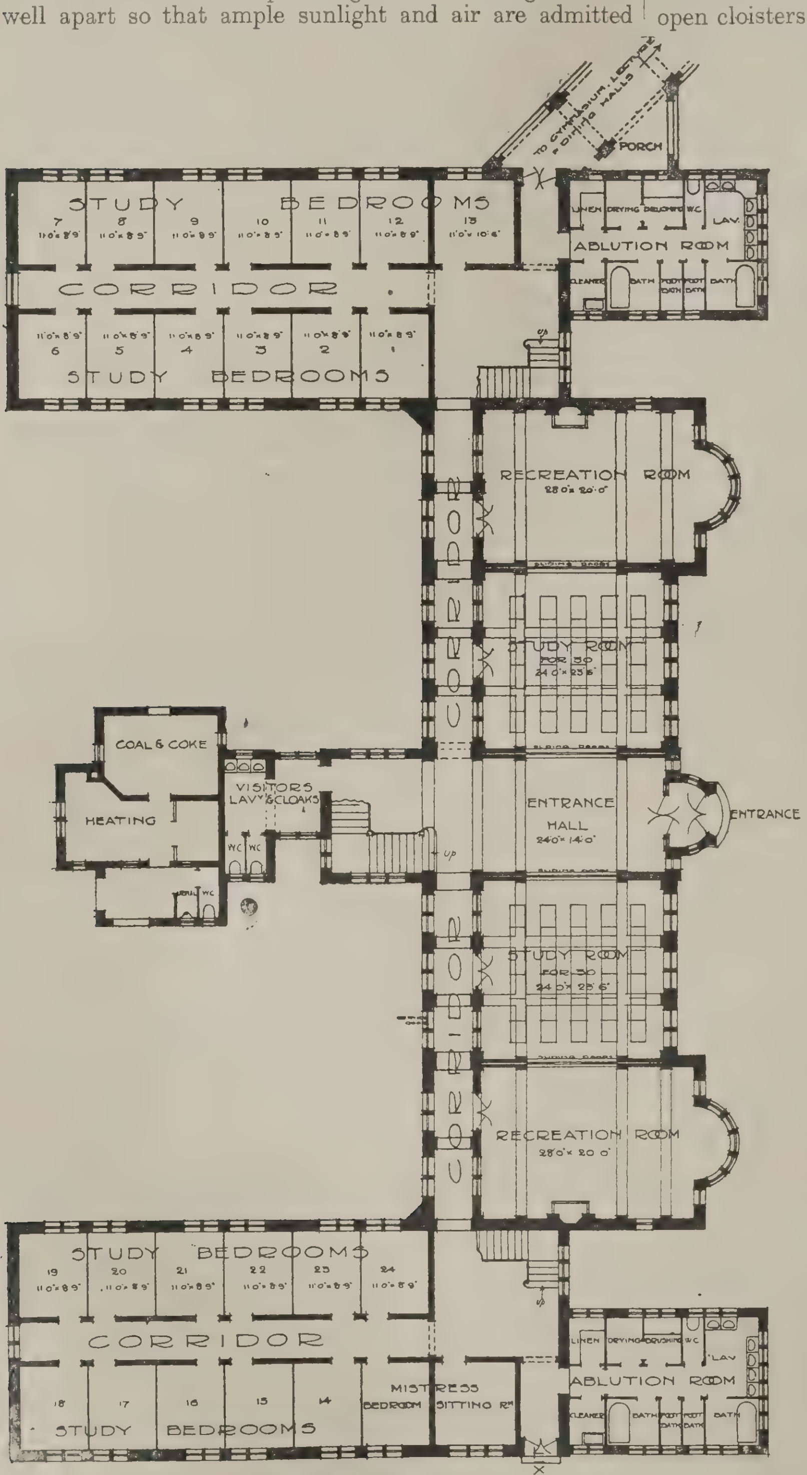
* See Illustration.

# ILLUSTRATIONS.

### DESIGN FOR TRAINING COLLEGE, HULL.

THE accompanying drawings illustrate the design submitted in competition by Mr. E. STANLEY HALL, M.A., of 54 Bedford Square, W.C., which was one of those commended in our issue of November 5, 1909, for its picturesque grouping of buildings. The design is based upon the tradition of an old university college, varied to suit the general and special requirements of more modern planning. The buildings are set well apart so that ample sunlight and air are admitted on every side; at the same time every block is interconnected by short covered ways. The buildings are grouped round the north, east and west sides of a quadrangle, which measures 250 feet east and west between the buildings. The only entrance to the grounds is through the main gates, which are on the north and south axis of the quadrangle and almost central in the road frontage. The porter's lodge is immediately inside the gates on the left, and his living room is in the angle of the lodge facing them. Immediately beyond the lodge a road runs off to the right to the kitchen block, and is continued round the entire group of buildings back to the porter's lodge. This is the road for all tradesmen's carts, and by it coal carts can deliver directly to the coal stores in each unit. The approach to the quadrangle is by an avenue 200 feet long running directly from the gates along the north and south axis and branching east and west into a circular road to the entrances of the men's hostel on the east, the women's hostel on the west, and the hall and lecture-rooms block on the north. The two hostels are connected with the lecture block by open cloisters running diagonally across the two northern angles of the quadrangle. The refectory and kitchens block and the gymnasium open off these diagonal cloisters, so that there is a sheltered means of communication between all buildings. As was suggested in the instructions, the whole of the northern half of the site has been left open for playing fields. They are shown laid out for three full-size hockey or football grounds, while ample space is left in the middle for the cricket pitch, which would not be played over in the winter months. Four tennis courts are shown on the lawns of the quadrangle, and four more along the north-east boundary of the site. All these courts lie north and south. One fives court is placed against the north-east wall of the gymnasium. The Principal's house is placed in the south-east corner of the site, with its own private garden. His private carriage-drive branches off the outer circular road. From his study window he commands a view of the whole of the college, while the desirable amount of privacy for his household is secured. The buildings were designed to be faced with red hand-made bricks and stone dressings, the roofs covered with brown tiles, and the windows were to be iron casements with leaded lights. The total estimated cost was 39,947*l.* 15*s.*



GROUND PLAN

### HOUSE AT RIPON.

THE site, facing as it does a small natural lake, has to a large extent determined the design, and so an endeavour has been made to design a house which would in no way detract from the surroundings. Between the front and the lake is to be laid out a sunken garden with lily pond connected to the lake. The walls are built of brindle bricks with cherry-red facings; roofs of Broseley tiles. The entrance gates are of wrought iron surmounted, as shown, with the owner's coat of arms. Internally, the design has been treated in a free Georgian manner, the joinery being of English oak. Some small amount of carving has been designed *à la* GRINLING GIBBONS, but this is restricted mainly to the mantels and the staircase newels. The ceilings of the principal ground-floor rooms are in plaster, with ornament in high relief. The architect for the house is Mr. H. STANTON WEBBER, F.S.I., Maidenhead.

### WINDOW IN CHRIST CHURCH, WIMBLEDON.

THIS window, by Mr. HUGH ARNOLD, has recently been placed in Christ Church, Wimbledon. It is a small window in the north aisle, the two outer lights being about three feet high, and the subjects which have been chosen so as to form part of a series illustrating the Life of CHRIST are the Flight into Egypt, CHRIST among the Doctors, and the Baptism in Jordan. The prevailing colour is blue, the use of red being limited to small jewel-like pieces here and there. A coloured full-sized cartoon of the window was shown in the recent exhibition of the Arts and Crafts Society.

## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, in the premises at Tufton Street, Westminster, Mr. H. Tanner, F.R.I.B.A., president, in the chair.

The Hon. Secretary made the following announcements:—The fifth Spring visit would take place on March 12, to the new King's College Hospital, Denmark Hill, by permission of the architect, Mr. W. A. Pite, members to meet at the building at 3 P.M.

The next meeting of the Camera and Sketching Club was fixed for March 17, when Mr. Alan L. Snow would read a paper entitled "Architectural Books," and a joint meeting with the Art Workers' Guild and the Debating Society on March 11, to discuss a paper by Mr. A. R. Jemmett, entitled "The Study of the Crafts in Relation to the Practice of Architecture."

On Monday and Tuesday, April 18 and 19, the A.A. Play "Arctia" would be performed at the Court Theatre.

Messrs. G. McLean and F. S. Mumford were elected members.

On the motion of the President a hearty vote of thanks was passed to the Royal Institute of British Architects for the nineteenth annual grant of 100*l.* towards the educational work of the Association.

### House List, Session 1910-11.

The President said the following names were put forward by the Council as officers for the next session:—President, Arthur Keen*; vice-presidents, Sir A. Brumwell Thomas,* Gerald C. Horsley*; ordinary members, C. C. Brewer, W. D. Cathcart, F. Dare Clapham,* F. C. Eden, Horace Field,* W. Curtis Green, Herbert A. Hall,* P. W. Lovell, Percy May,* F. Winton Newman,* H. Passmore, C. Wontner Smith,* J. H. Squire, W. J. Tupper, S. J. Tatchell, Stanley Towse; hon. treasurer, Henry Tanner*; hon. secretaries, Edwin Gunn,* G. Leonard Elkington*; hon. librarian, T. W. Watkins; hon. editor *A.A. Journal*, Allen Foxley.

Mr. J. Alfred Gotch, F.R.I.B.A., read a paper, illustrated by lantern views, entitled—

### The Mediæval House.

Young Gamelyn stood at the door of a mediæval house. The house was his brother's, where he had been brought up. Brought up, it is true, but in no manner suitable to his parentage; for his brother withheld from him his heritage, left to him by the knight his father on his death-bed sixteen years before. At that time Gamelyn was too young to take care of himself. He was what would now be called the residuary legatee of his father, and his share was the largest, comprising lands, parks, woods, and two houses, besides all the old knight's horses. All these were kept from him by his brother. He himself was ill-fed and ill-clothed; his property was allowed to go to rack and ruin. His parks were broken, his deer taken away, his houses unroofed, his horses denied him. With the lapse of time, however, Gamelyn began to realise that he was being defrauded of his rights. He had now grown up to be a youth of uncommon strength, and standing one day in the courtyard of the house he pulled his beard thoughtfully and resolved to have matters righted. Just then his brother came near and began to taunt the simple, good-humoured Gamelyn, who hitherto had taken his ill-treatment with the meekness of inexperienced youth. But now Gamelyn fired up and gave back word for word, until the enraged brother ordered his men to fetch staves and beat him. Then Gamelyn gave them a taste of his quality; seizing a pestle that lay near he drove them all "of a heap," while the brother flew into a loft for safety and shut the door fast. A parley ensued, and Gamelyn, whose wrath was soon appeased, explained that he wanted no more than his inheritance, but that he was determined to have. The false brother, on his part, explained that he had intended no harm to Gamelyn in ordering him to be beaten—he merely wished to try his strength; and as for his inheritance, he should certainly have it. The reconciliation was then sealed with a kiss, genuine on the part of the youth, traitorous on that of the brother.

Presently Gamelyn heard of a great wrestling match in which a celebrated champion was taking part. Of course, he went there, vanquished the champion, bore off the prize—the ram and the ring—and, followed by an admiring party of young men, he went home with much joy in the morning. And so young Gamelyn stood before the door of a mediæval house.

Except perhaps for a little postern, the mediæval house had but one door, which gave entrance to a courtyard, on the further side of which lay the hall. The outer wall was high, windowless, inaccessible; Gamelyn must enter through this door or not at all. But his false brother had ordered it to be shut and locked, for he had seen the party approaching, and he was vastly better pleased that Gamelyn should be without than within. The porter in charge of the door, who stood in dread of his lord, had locked the great gate and secured the wicket with a pin.

"Porter, undo the gate," cried Gamelyn, "for many a good man's son stands here!"

"By God's beard," replied the porter, "thou shalt never come into this courtyard, Gamelyn!"

"Thou liest!" answered the vanquisher of the champion; and with that he kicked the wicket so furiously that the pin broke and it flew open.

Then the porter, seeing no help for it, fled across the courtyard. But Gamelyn cried, "Thy labour's lost, for I am as light-footed as thou!" And lost his labour was, and his life too, for Gamelyn overtook him, broke his neck with a single blow, took him by an arm and flung him down the well, seven fathoms deep, of which the open walled mouth, with its windlass and bucket, stood in the courtyard.

The other men in the court were too much in dread of his prowess to interfere; they "drew themselves away," and Gamelyn, returning to the entrance, flung the great gate wide open for all to come in who could walk or ride. An interesting touch this limitation to pedestrians and equestrians, for the gates of nearly all mediæval houses are narrow; there was no occasion to provide for wheeled traffic.

So the crowd of young men came through the gateway into the courtyard. Gamelyn welcomed them heartily. "Yesterday," said he, "I left five tuns of wine in my brother's cellar; not a drop will we leave undrunk. If my brother grumble he shall have St. Mary's curse. He is a niggard, but we will spend what he has spared, and if anyone objects to our being here he shall follow the porter into the draw-well."

Such a threat from so doughty a hero had its effect, and for seven days and seven nights the company made merry, while the false brother lay hid in a little turret—one of those turrets which add so much to the picturesqueness of a mediæval house—and watched the wasting of his substance in cowardly rage.

But on the eighth day the guests departed, in spite of their host's remonstrances, and Gamelyn stood there, friendless and alone. Then came his brother forth from his solar—the parlour of a mediæval house—whither he must have gone from the turret when he saw the coast clear. Finding Gamelyn alone, he plucked up his courage. "Who made you so bold," said he, "as to destroy my store?"

"Brother," replied Gamelyn, "for sixteen years you have enjoyed my inheritance; that will pay for what we have now eaten and drunk."

"Look here," said the wily brother; "I have no heir, brother Gamelyn. By St. John, you shall be my heir!"

"By my faith," replied the other, "if you think as you say, God requite you!"

"But, Gamelyn, one thing I must mention; when you threw the porter down the well I swore in my wrath that you should be bound hand and foot. Do not let me be forsworn. Let me bind you, just to fulfil my vow."

"Brother," said the guileless youth, "you shall not be forsworn for love of me." And so he innocently suffered himself to be bound, and they fastened him to a post in the hall—probably to the framework of the wood screen, which in a mediæval house divided the entrance passage from the hall itself. All who came in saw him, and his brother explained to them that he was mad. For two days and two nights he stood there without meat or drink, and it was borne in upon him that his brother was a villain. At length he found a chance to speak to Adam, the spencer—the butler as we should call him.

"Adam, spencer, I have fasted too long. By the love my father bore you contrive to get the keys and set me free, and I will give you some of my land." But Adam answered, "I have served your brother these sixteen years, and if I let you go out of this bower he will say I am a traitor." "Adam, you will find him a traitor; therefore, brother Adam, set me free and I will give you some of my land." Thereupon Adam consented, and when his lord had gone to bed he found the keys and set Gamelyn free, in good hope of his reward. Then said Gamelyn, "Thank God, now I am free. Could I but eat and drink aright there is none in this house who should bind me again." So Adam the spencer took him quietly into the spence—which was the storeroom or cellar of a mediæval house—and gave him food and wine. When he had eaten his fill, "What do you advise, Adam? Shall I go to my brother and strike his head off?" "Not so," said Adam. "I can show you a trick worth two of that. We are to have a great feast on Sunday, when many abbots and priors and men of holy church will be here. You shall stand as though still bound, and when they have eaten and washed their hands [for they ate with their fingers in a mediæval house] you shall beg them to set you free, which if they do, all will be well and I shall be blameless; but if not, then you shall have a staff and I another—and cursed be he that fails the other!"

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* Members of present Council.

So it was arranged that should things come to this pass Adam was to give the signal and they both were to fall to.

The Sunday came and the guests with it, and as they came in at the hall door they saw Gamelyn bound. As they sat at meat the false brother told all the harm and shame of Gamelyn that he could invent. At length the youth begged to be given food—it was not well that he should fast while others made merry. The false brother explained to his guests that the man was mad. After a while Gamelyn appealed once more to the great lords that sat in the hall.

"Help to set me free from my bonds!" cried he. But the abbots and the priors only mocked and reviled him. Then Adam gave the signal; Gamelyn slipped off his bonds, and the two of them started cudgelling the whole company. Adam thought no more of his pantry, but stood guard at the hall door, while Gamelyn raged among the men of holy church. The laymen stood by in benevolent neutrality. At Adam's urgent entreaty Gamelyn spared the heads of his enemies, and did no more than break their legs and arms, so that whereas they had ridden to the feast blithely on horseback, they were led from it miserably in carts and wains. The false brother got his share of the cudgelling, and was bound in the cast-off fetters of Gamelyn. Then the two assailants called for water and washed.

Meanwhile the sheriff, who was in the near neighbourhood, heard of the fray and cast about to take the assailants. To him came four-and-twenty young men with offers to bring them prisoners to him; and they hastened to the gate of the house, which they found fast closed and under the care of a new porter. In vain they knocked and demanded admission. The porter carried their message to Gamelyn, who took counsel with Adam upon their desperate plight, with many foemen without and no friends within. Their resolution was soon taken—to have a final fling and then betake themselves to the woods. Armed each with a fresh staff, Gamelyn slipped out through the postern and Adam through the wicket of the great gate. Suddenly attacking the four-and-twenty young men, Gamelyn felled three and Adam two, while the rest fled, followed by the sarcasms of the spencer. But the sheriff was at hand, and, seeing the uselessness of further fighting, they betook themselves to the wood, and left the mediæval house behind them.

With their further adventures, which have to do with the forest and not with the house, we need not concern ourselves. If anyone wishes to follow Gamelyn and Adam into the woods to learn how they fell in with outlaws; how Gamelyn eventually became their king; how a price was set on his head; how his trial was held; how, with his customary masterfulness, he attended the trial; violently ousted the judge from the judgment seat and took it himself; how he finally caused his false brother, the partisan judge, and the twelve complaisant jurymen to be all hanged; how he made his peace with the real King, and was made Chief Justice of the Forest—if anyone wishes to do this he can do it in the pages of Chaucer.

The interest of the tale to us lies in the picture which it incidentally portrays of a mediæval house; how the house had to be planned to resist violent attacks, and how jealously its narrow entrance had to be guarded. We see the courtyard with its well, and wonder perhaps how far the body of the porter with his broken neck rendered its water unpalatable. We see the hall and its screen, with the pantry close at hand; the cellar where Gamelyn replenished his wasted strength; the turret to which his brother fled, the solar from which he emerged to upbraid the headstrong young man. Having thus, with the aid of Chaucer's lively pen, formed a mental image of a mediæval house, let us see how far we can substantiate it from some of the mutilated houses that have come down to us.

The accommodation in a mediæval house was not extensive. We must not take Haddon, for instance, as typical in this respect; it was the home of a very considerable personage, and much above the average in point of size. But imagine Haddon smaller and you get a good idea of a mediæval house. There is the main gatehouse, inaccessible to all but people on foot or horseback; there is the courtyard, and beyond it the hall; there are turrets and towers; there are the screens of the hall giving access to the pantry, the buttery, and the kitchen passage; there are several rooms which might stand for the spence; and the solar, or principal room of the lord, is represented by the quaint panelled parlour.

Stokesay Castle is perhaps nearer to Chaucer's description. The gatehouse, it is true, was rebuilt in Elizabeth's time; but restore the walls which abut against it to their ancient height and you get just such a courtyard—well and all—as that across which Gamelyn chased the porter. The hall, too, is such an one as might have been filled with the abbots and priors and men of holy church, who, full of meat and wine, mocked Gamelyn in his distress, and were so handsomely cudgelled in return. At Stokesay the fire was placed upon a hearth in the middle of the room, as it was likewise at Penshurst; at Haddon, on the other hand, the equally frequent alternative was adopted of placing it in a recessed fireplace with a proper smoke-flue.

Stokesay has no little turrets, but it has a large strong tower, where the false brother might have felt safe. It has, too, an outside staircase, up which he might well have fled to a loft; it has a solar with windows looking into the hall; and at each end of the hall is a room which might have been the spence.

The solar was originally the small private room of the lord—probably, in quite early houses, the only private room of the house; the hall itself being the day-room and night-room of the whole household. It was the germ of the long series of private apartments—bedrooms, dressing-rooms, parlours, drawing-rooms, smoke-rooms—which are now indispensable to a comfortable, well-ordered mansion. In Chaucer's time it had grown into a short series of similar rooms, but they were still few in number. It is clear from his narrative that the false brother slept in some kind of a bedroom, and also that the hall was no longer used as a sleeping-place by the household, inasmuch as Adam was able to liberate Gamelyn, who stood bound in the hall, and to take him secretly to give him food in the spence. But notwithstanding this implied increase in privacy and comfort the house of Chaucer's time would be intolerable to the hardiest of us now, even to the most enthusiastic advocates of the "simple life."

One important room which Chaucer had no occasion to mention, but which was to be found in every mediæval house, was the kitchen. In early times it was second in importance only to the hall; it was connected to the lower end of that apartment, while the solar was usually attached to the upper end. The kitchen was not infrequently built of wood, or of wood and plaster, a mode of construction which was adopted in the majority of houses, and which accounts for their disappearance. It is only a certain proportion of those which were built in stone that have survived.

*(To be concluded.)*

## THE SITE OF THE SAXON CATHEDRAL CHURCH OF WELLS.*

SO many attempts have been made to unravel the architectural history of the cathedral church of Wells, and such conflicting views have been put forth to explain it, that it may seem hopeless now for anyone to get a hearing for an entirely new theory as to its beginnings. Yet I am going to be so bold as to put forth such a theory, and I crave your patience while I unfold it.

In Vol. xix. of the "Proceedings of the Somerset Archæological and Natural History Society" there is printed a paper by Mr. J. T. Irvine, entitled "An attempt to separate and describe in the proper order of their erection the various portions of the fabric of the cathedral church of Wells." In the ground plan which illustrates this paper, Mr. Irvine shows to the south of the transept the outlines of two buildings, the one rectangular, the other octagonal, as projecting from the east side of the cloister into the vicars' old burying ground. The former he elsewhere calls "Stillington's chapel" and states that "the valuable information on the plan respecting" it was "obtained by the kindness of Prebendary D. M. Clerk, from his measurements obtained when he had excavations made in 1850."

The evidence as to the existence of the octagonal building, which was apparently discovered during the same excavations, had always seemed to me so slight, that in 1894, at my representation, the site was again examined through the kindness of the Dean and Chapter. The results are embodied in a paper "On the Lady-chapel by the Cloister of Wells, and the adjacent buildings," by Mr. Edmund Buckle, printed in Vol. xl. of the "Proceedings of the Somerset Archæological and Natural History Society."

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* A paper read on March 2 by Mr. W. H. St. John Hope, M.A., before the Royal Archæological Institute.

The fragmentary foundations disclosed by the excavations have been ingeniously shown by Mr. Buckle to have belonged to two distinct buildings. One of these was a large cruciform structure, the west wall of which still remains to a considerable height, and formed the Lady-chapel built by Bishop Robert Stillington during the later years of the reign of King Edward IV.

The other building was of a totally different character and of more than one period. The oldest fragment apparently belonged, not to one of octagonal plan, but to the eastern portion of a square-ended structure 15 feet wide and of early date. To this aisles had been added in the thirteenth century. But the most curious feature of these foundations is, that while those of Bishop Stillington's chapel were exactly square with the cloister and cathedral church, the earlier fragments belong to a building which makes with the cloister an angle of twelve degrees.

This obliquely placed building has been conclusively shown by Canon Church to have been identical with the "chapel of the Blessed Mary which is situated on the south side of the greater church of Wells" mentioned in a charter of 1250, and which was apparently enlarged, probably by the addition of the aisles, by members of the Bitton family about 1275, when an altar of St. Nicholas was constructed in it. A chapel of St. Katharine within it is also mentioned in a will of 1392, and her altar was afterwards transferred to the new chapel (see will of 1486). The fragments of the older building showed that the aisles extended as far eastward as the chapel itself, and that it was of three bays, with arches opening into the aisles in the two western bays. The western respond of the south arcade still remains embedded in the cloister wall which formed in later days the west end of the chapel. This wall is believed by Mr. Buckle, and I have no reason for dissenting from his view, to be contemporary with the north porch of the cathedral church, which he assigns to a date circa 1185. The wall contains a large doorway (now blocked) that led into the earlier Lady-chapel, but this doorway is an insertion by Bishop Joscelin after 1220. South of it is a smaller doorway, also now blocked, that led westwards from the cemetery, but this is contemporary with the wall. Mr. Buckle also pertinently argues that since the chapel stands so obliquely with regard to the wall, it must be older than the wall, and that possibly it occupies the site of a chapel of Our Lady which was endowed in the eleventh century by Bishop Giso with a virgate of land in Wootton. "If this is so," Mr. Buckle continues, "the difficulty caused by the oblique position of the chapel vanishes at once; for in that case the chapel is of higher antiquity than the present cathedral, and nothing is known of the direction or even of the exact site of the earlier Saxon church."

Mr. Buckle thinks also that the obliquity of the direction of the chapel is to be accounted for by the existence, parallel with it, of the stone conduit that carries off the overflow from the smaller of the two St. Andrew's wells to the east. Here I must leave Mr. Buckle and revert to my theory of the beginnings of the cathedral church of Wells.

And first let me direct your attention to the Ordnance Survey plan of the city of Wells.

It will at once be seen from this that while the general axis of the city and the trend of its roads and streets is generally some twelve degrees north of east, the cathedral church and the contemporary portions of the cloister and bishop's palace alone stand nearly due east and west. Why church and palace should have been so set is at present immaterial, but it is all important to notice that the general direction of the town and its streets coincides nearly, if not exactly with the obliquity of the older Lady-chapel.

In explanation of this I must revert to the early history of the church of Wells.

A church is believed to have been founded here by Aldhelm, bishop of Sherborne, between 705 and 709. This church, which was collegiate (that is to say, it was served by a college of priests) was made cathedral in 909, when Athelm was consecrated first bishop of Wells.

No mention of the structure of the church occurs until the days of Giso, the fifteenth bishop, consecrated in 1061, who himself says that on taking possession of his new see:—"Seeing that the church of my see was but a middling one and also that four or five clerks were there without a cloister and a frater, I devoted myself of my own free will to the building of them."

Giso accordingly obtained from King Edward the grant of Wedmore, and from Queen Edith lands in Merken and Modesley. He also recovered the vill of Wynesham which had been alienated from the church, and bought other property for the augmentation of the canons and their support. The bishop goes on to say that having compelled his canons to live according to rule:—"I prepared for them a cloister, a frater, and a dorter; and everything which I knew was necessary and fitting for them, according to the manner of my own country (Lorraine) I laudably added."

Giso died in 1088 after ruling the see for twenty-eight years, and was buried in the church which he had ruled, in a recess made in the wall on the north side near the altar, as Dudoc, his predecessor, was buried on the south beside the altar.

It is clear from this that Giso did not rebuild the cathedral church, despite its being "middling"—*mediocrem.*

Giso was succeeded by John of Tours, who in 1090 removed his bishopstool from Wells to Bath as being the more important town, and deprived the canons of part of their revenues.

"The houses also of the canons which the venerable Gyso had built, namely, the frater and the dorter, also a cellar and other necessary offices, with the cloister, having been destroyed, the canons whom Gyso had taught to live by rule and religiously were turned out of doors and driven to live a common life with the people."

So says the "Historiola," but the Canon of Wells adds, apparently without any authority:—"And the site on which they first dwelt he usurped for himself and his successors, and built his episcopal palace there. And although when broken by age he repented of it, he neither repaired the destroyed buildings of the canons nor restored to them the site unjustly taken away."

Of the German Bishop Godfrey, who succeeded John in 1123, nothing particular is recorded, but a charter of Bishop Robert incidentally mentions his having hallowed the church of St. Cuthbert, and endowed the rectory with half a hide of land in North Wootton.

Bishop Robert succeeded Godfrey in 1136, and as Canon Church has pointed out, "set himself at once to the recovery of Wells from the humiliation under which it had been left by the rule of Bishop John of Tours." He removed the provost who had hitherto governed and oppressed the church, and instituted in his stead a dean with a subdean, a precentor and subchanter, a treasurer and a chancellor. The manor of Biddisham was set apart "to repair the church of the blessed Andrew and to buy ornaments for it" ("ad reparandam ecclesiam beati Andreae et ornamenta emenda"). The same charter also tells us of the half-hide in Wootton which Bishop Giso gave with a virgate of land to the chapel of St. Mary.

The "Historiola" contains a very important statement with regard to Bishop Robert. After describing his new building of the church of the blessed Peter at Bath, together with the chapter-house and cloister, the dorter, the frater and the farmery, it continues:—"Moreover it must not be forgotten that the church of Wells was built by his counsel and aid. And so it was, that when the church of Wells was finished by the same lord of Wells, having associated with him three bishops, famous and of good memory, Goscelin of Sarum, Dan Simon of Worcester, and Dan Robert of Hereford, he hallowed and dedicated the same church."

From the dates of the assisting bishops this consecration must have taken place between 1142 and 1148.

What is precisely meant by the statement of the chronicler is a little difficult to understand. In describing Bishop Robert's work on the Bath church he says "cum magnis expensis construi fecit," that is, "he caused it to be built;" but of the Wells church that "suo consilio et auxilio fabricata est."

A fifteenth-century writer on Wells states that Bishop Robert "finished the fabric of the church of Bath begun by John of Tours; dedicated the church of Wells in the presence of Bishop Gocelin of Sarum, Simon of Worcester, and Robert of Hereford; and admirably repaired many ruinous portions of the same church (which were) threatening its destruction in divers places."

In attempting to reconcile these statements (1) that Bishop Robert helped to build anew the church of Wells, and (2) that he only repaired it, we are met with the difficulty that practically no remains of any Norman church have hitherto been met with at Wells, while there is ample proof that the new abbey church of Bath was of quite imposing dimensions. That too escaped rebuilding until the close of the fifteenth century, while Robert's church at Wells, if ever it existed, must have been swept away within fifty years of its building.

The hallowing of it, on the other hand, which is so explicitly recorded, certainly points to some rebuilding or enlargement, and the question is, what was the nature of it?

I should like to suggest that Bishop Robert first repaired the old Saxon church, and at the same time, to make more room for his newly founded chapter, enlarged the church by extending it eastwards. And I should like to feel that the early square end among the fragments excavated east of the present cloister was a remnant of this enlargement. In that case the addition to the old church may have included a new Lady-chapel, and this may be the reason why it alone was kept when the rest of the church was destroyed. But I have no documentary proof of this, and merely submit it as a suggestion.

You will please note, however, that it presupposes one important fact, that the site of the Saxon church is not to be looked for within the area of the present cathedral church, but in the cloister known of old as Palm churchyard, to the west of the obliquely placed foundations laid bare in 1894.

Excavations here are unfortunately impossible owing to the number of graves, in the making of which any foundations were probably destroyed, but a church in this position, somewhat on the original lines of that at Brixworth, which was built in 680, and therefore a little before the first church at Wells, would have sufficed for all the spiritual needs of the place for quite a long time.

I regard the conduit that runs parallel with its line as having been made rather as a drain to carry off storm water from the roofs of a considerable church, than as a means of supplying water to it.

In connection with the position of the Saxon church I should like to call your attention to another fact. In a charter which, though undated, must be earlier than 1160, since it is witnessed inter alios by Ivo the first dean, Bishop Robert recites how "it is well known to the experience of some, that the tumult of the fairs which have hitherto been wont to be held in the same church and in its forecourt (atrium) brings dishonour and injury to the same church, and is particularly burdensome to those ministering in it, by reason of its hindering their devotion and disturbing the quiet of their prayers." "Nevertheless," continues the Bishop, "lest we suffer contrary to the Lord's word the house of prayer to become a den of merchandise, we appoint and firmly ordain that whosoever assembles thither on the three feasts of the Invention of the Holy Cross, the feast of St. Calixtus, and the celebration of St. Andrew to do business, shall perform their business in the broad places of the town . . . and that they in no wise presume to violate the church or the forecourt of the church."

Now it will be noticed that on the west side of the existing cloister, between it and the market place, there is still an irregular shaped area, entirely out of square with the cloister, but with north and south walls having the same general direction as the market place and High Street and almost exactly parallel with the axis of the foundations in the vicars' cemetery. And I submit that we probably have here the site of the very atrium or forecourt referred to in Bishop Robert's charter, and so are able approximately to fix the place of the Saxon church. The forecourt would be conveniently at the head of the market place, and this led quite naturally to the chief church of the city. It is also possible that until Bishop Beckington absorbed the northern half of it, by building there the existing row of shops that formed his nova opera, the market place was as wide as the forecourt east of it; and it is quite easy to suppose that the fairs which were at first held in the market place would overflow in time into the convenient court between it and the church whence they were removed by Bishop Robert.

If this theory as to the position of the Saxon cathedral church be accepted, it clears up some other difficulties.

To mention one, it has always been a puzzle why the present church, if built upon the site of a former one, should be so singularly free from older influences in its plan and from all traces of older materials in its construction.

But if the old church continued standing in the cloister while the new one was rising on another site both these difficulties vanish. There was also nothing to hinder the new church from being laid out with a different axis from the older, as it certainly was, though I am unable to offer any tangible reason for it.

That Bishop Robert had nothing to do with the building of the new church is sufficiently evident on architectural grounds, and Canon Church has demonstrated beyond doubt that it must have been begun by Bishop Reginald FitzJoscelin, who succeeded Robert, after a vacancy of nearly nine years, in 1174.

To Bishop Reginald is certainly due, not only the ground plan, but a very considerable section of the existing building. After his death in 1192 the work probably proceeded, but slowly, under Bishop Savaric, who was largely an absentee. He instituted however the daily mass of Our Lady, and possibly completed the Lady-chapel at the east end of the church, the altar of which is mentioned in 1206-7.

Savaric was succeeded in the bishopric in 1206 by Joscelin. He was in exile from 1206 to 1213, and this fact, as well as a great struggle with Glastonbury as to the independence of the Abbey, which lasted until a final concord in 1219, must practically have stopped all work upon the new church.

The resumption of extensive building operations is perhaps marked by the royal grant in 1220 of sixty great oaks from the Cheddar woods "to make a certain limekiln for the work of the church of Wells."

The new church was hallowed by Bishop Joscelin in 1239, and in a charter of 1242 the bishop speaks of it in terms which show that it was then finished.

That it was so, except probably as regards the upper works, is proved by an act in chapter of July 9, 1243, a year after Joscelin's death, as to the arrangement of the burial-grounds.

To the canons residentiary was assigned the area of the cloister south of the church, beginning at the south door and then southwards, and back again.

No layman or vicar was to be buried among the canons, but the vicars were to be buried "in the cemetery towards the east behind the chapel of the Blessed Mary." That is, in the already existing burial-ground around the Lady-chapel on the east of the cloister.

The lay folk were to be buried "in the cemetery towards the west" and their burials were to begin "beside the elms there planted alongside the place where the jousting ground was wont to be, and so extend themselves towards the west," but no layman was to be buried before the west doors of the church.

The dignitaries might be buried in the nave (which was therefore now finished), if they or their friends so willed it.

This interesting award brings us back again to the question of the site of the earlier church.

It is clear that the lay folks' cemetery before Bishop Joscelin's new west front was also new, since it is directed where burials shall begin, and the site is expressly stated to have adjoined the jousting ground. It cannot therefore be the same as the atrium or forecourt of the old church from which fairs were excluded.

The area of the cloister is also assigned for the first time as a burying-ground, perhaps because it had lately been cleared through the taking down of the old church and any adjoining buildings.

The cemetery behind the Lady-chapel was apparently an old one, which was henceforth to be reserved for the burial of the vicars only.

Concerning the entrances into the present cathedral church Canon Church has reminded me of the important bearing which they have upon the points raised in my paper. The doorways in the west front are not the chief entrances at all, but merely the means of communication with the cemetery. The great north doorway, with its protecting porch, was the entrance for the canons and other officers, all of whom lived on the north side of the church. The main entrance from the city was under the south-west tower, through part of the western alley of the cloister, which in turn was entered through a regular gatehouse from the site of the very atrium referred to above.

Here I think I may end my paper, and it is for the Institute to say whether it is satisfied now that the Saxon church must have stood obliquely across the present cloister, westward of the Lady chapel uncovered in 1894; and also that the existing cathedral church knows no other beginning than that by Bishop Reginald, on a new site, in the third quarter of the twelfth century.

## GLASGOW INSTITUTE OF ARCHITECTS.

THE annual general meeting of the Glasgow Institute of Architects was held last week in the rooms, 39 Elmbank Crescent, Mr. George Bell, F.R.I.B.A., president, in the chair. The secretary submitted the forty-second annual report, from which it appeared that the membership of the Institute now stands: 104 Fellows, 64 Associates, 40 lay and 27 student members, a total of 235. During the past year the Council had frequently under consideration the conditions of competitions, promoted in the Institute's province, which had been found to be unsatisfactory. In these cases representations were made to the promoters for amendment of the conditions, and in several instances the Council was successful in effecting this. The Society of Engineers, London, called the attention of the Council to cases in which architects have employed engineering manufacturers and contractors to do professional work, which they felt to be detrimental to both professions. On the other hand, the Society of Engineers was aware that engineers frequently employed builders and contractors, and they had asked their members to employ properly qualified architects in connection with engineering work in which architectural work is involved. The Council, while approving of the desire to bring about a better understanding between the two professions, pointed out that it was not the practice in this district to employ other than qualified engineers when the nature of the work requires it. A memorial was received from the Stone Carvers' Trade Association, London, pointing out the evils of allowing carving to get into the hands of those who subcontracted it to carvers who tendered lowest, irrespective of the quality of the work, this practice causing scamped work, and making it more difficult for architects to obtain good work than if they dealt with the carver direct. The Council concurred in the views stated in the memorial, and replied expressing sympathy with it. A resolution by the Glasgow Master Brickmakers' Association that it was desirable to have a uniform thickness of brick in the trade was considered, and the standard thickness of three inches suggested by the Association was approved of. The Council for the ensuing year was elected as follows:—Messrs. George Bell, Alex. Skirving, Robert Miller, John B. Wilson, J. J. Burnet, James A. Morris, Henry Mitchell, John Watson, R. D. Sandilands, Neil C. Duff, J. K. Hunter, A. N. Paterson, W. G. Rowan, John Fairweather, Charles R. Mackintosh, Robert Wemyss, Alexander Wingate, and W. J. Blain. A meeting of the newly-elected Council followed, at which the following office bearers for the year were appointed, viz., President, Mr. John B. Wilson, F.R.I.B.A.; vice-presidents, Mr. Alexander Skirving, F.R.I.B.A., and Mr. Alexander N. Paterson, F.R.I.B.A.; auditor, Mr. James M. Monro, F.R.I.B.A.; secretary and treasurer, Mr. C. J. MacLean, writer, 115 St. Vincent Street. The various committees for the year were also appointed.

## "CASTLES IN THE AIR."*

MANY times in this place has been urged the necessity of a thorough knowledge of the possibilities and limitations of the materials to be dealt with by the craftsman. And we should keep this principle before us to-night, in dealing with the craftsman and his "Castles in the Air."

The possibilities and limitations of our nature, both physical and spiritual, must be as interesting as those of lead and timber, and certainly must underlie and affect our understanding of everything else whatsoever. Thus we find that technical qualities will carry us nowhere without thought and feeling.

As Carlyle has said, "The spiritual is the parent and first cause of the practical." The artist must be the high priest, and preach the gospel of beauty through the ritual of material creation, ceaselessly pouring into his work that spiritual grace which shall increase interest in moral qualities, and win us by love of beauty to love one another.

Moral beauty is first manifested in man, and by him to be recorded in matter.

To all who believe in accident or chance, and who deny that all things are subject to inexorable law and order, and are working together for ultimate good, I can only say—fare you well! for to you I must appear a poor, wild visionary, and only arouse your smiles.

Belief in law and order imposes the duty of searching for the good purpose in all phenomena.

Has it not been man's love of beauty and fitness, that is to say, the best that he is capable of seeing, conceiving, and understanding, which has ever acted as his lodestar, to guide him onward and upward? First appealing to his physical nature and leading him to attribute to the gods the noblest bodily functions, then through thought and feeling to still higher conceptions of Deity and beauty.

Often the feeling for beauty is only a sensation devoid of mental activity—drawing us magnetically to follow and investigate its source.

Hence we feel that all we can say or do that will stimulate the thirst for beauty helps towards the development and advancement of mankind.

Continuity, and advance through antagonism, characterise the æsthetic world, as they do the physical.

Life is one perpetual torrent of tears, and looking into the sins of others only adds to the flood.

Shall we then bewail our social conditions? shall we blame governments, or, as some would have us, anathematise the wicked machine, and the still more wicked duke? and repeat the old falsehood that no artist can do good work unless he is happy, and therefore fix our attention on the importance of environment?

Shall we rouse ourselves into passionate antagonism against the many evil influences we see around, and abuse the public (of which we are a part) for their materialism and lack of taste? Countless are the themes we might adopt to excite our resentment. There is nothing easier than to stir up hatred. But be it remembered that the hotter our anger boils, the more incapable we become of seeing and speaking truly. As Marcus Aurelius has said, our anger and impatience often prove much more mischievous than the things about which we are angry or impatient.

The evil monsters grow, as we warm them in our passions; and we think that the world would become a Paradise in a night if only our particular monster were beheaded, or our particular despot crowned. And we go grey by planning social revolutionary schemes. And the material with which we strive to build our temple of perfection is grey; all is grey and gloomy, and all colour is hidden by our tears.

If we would build "Castles in the Air," of such is not our material. Nor will we go to the extreme of the Christian Scientist and argue the non-existence of matter and evil.

For most men the existence of matter and evil is a practical reality, like light and darkness. And we want no metaphysical jugglery to confuse our perception of either.

Law and order, and clear understanding, will alone help us to classify our perceptions, according to their value. It is a mercy that men can never be induced to think alike on great social questions. Progress would be impossible if they could.

It is conflict of opinion that helps us to discover the truth, and makes us tenacious of it when discovered; and, better still, it drives us to examine our foundations, and temper our zeal. So our castles in the air are not to be built out of "isms." Nor will man-made by-laws help us.

Do we then want freedom? In the realms of moral thought and feeling we can only be free in proportion to our obedience to reason, conscience and love. We often hear artists bemoan their lack of freedom; they cry out for liberty, they regard liberty as essential to their full development, and so it is, if what is meant by full development is the expression of their lower nature.

Liberty is needed for vice and mundane things; restraint, control and law for all that is highest and best.

All artists must feel that the grand purpose of their vocation is to increase sensibility. If we were not sensitive, we could not aspire. The insensitive, if such there are, cannot feel their lack of refinement, or conceive their future possibilities. Sensibility makes us smart when we disobey law and order. It is the intensity of feeling that drives us onwards and upwards. The condition of painless luxuriance and ease weakens and debilitates. So it is clearly the artist's function to help men to see, and to feel that suffering is the parent of all virtue.

We are moved by compassion, pained by our own sympathy, and immediately forced to loving help by it. We suffer through lies and deception, and so are we driven to seek truth. We suffer through ignorance, and labour to know. Out of sorrow and sighing we must build, until we reach a higher plane where we can follow all virtue for love alone.

Belief in the good purpose of suffering is ennobling, as it leads us to search for law and harmony, and strengthens our optimism. Whereas the denial of good purpose behind our pain allows our resentment to kindle into blinding anger. And while resentful we cannot be producing beauty of any kind. Countless petty annoyances, if we will look into them, remind us that it is our attitude of mind towards what we regard as evil that makes it a blessing or a curse to ourselves.

The more fearlessly we peer into things and search out their moral purpose, the more we shall be convinced that all pain is a blessing in disguise, that we cannot spare a moment of our suffering. Remember we are speaking of our troubles as they affect ourselves, not at all of other people's sufferings. It is very necessary to keep this distinction clear in our minds, lest we undermine our compassion and our desire to help our brother workers. This anxiety to seek for good possibilities will help us to adapt ourselves to new and strange conditions and inventions, and to impress the idea that æsthetic qualities can be, and must be, given to all we do, even though our medium is as unkind as the machine or as forbidding as ferro-concrete.

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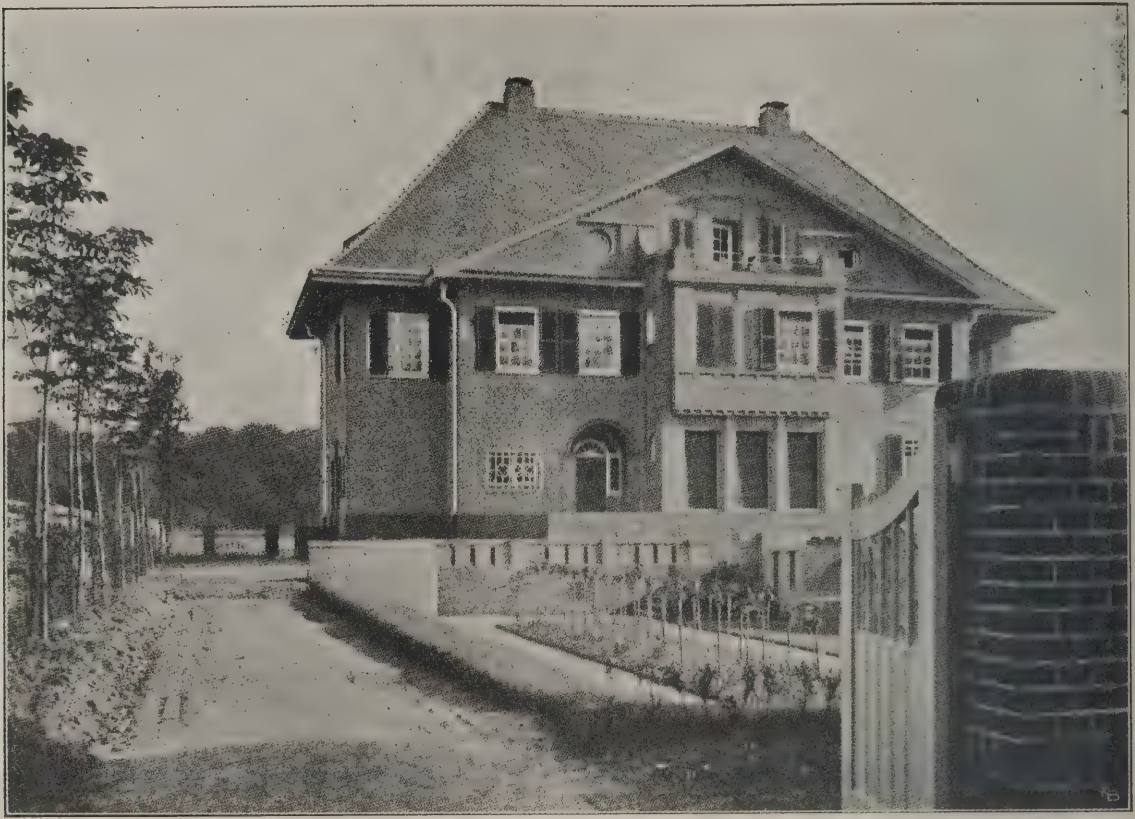
* A lecture delivered by Mr. C. F. A. Voysey on March 2 at Carpenters' Hall, London Wall, E.C.

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Dekorative Kunst.*

A BRICK HOUSE FOR HERR WALTHER von SCHEVEN, AT CREFELD.—Herr August Biebricher, Architect.

Has ever any craftsman derived pleasure from any piece of his work without having done battle with difficulty of some sort? And is it not that very battle which has heightened his joy in the final triumph, and is his consolation in the hour of defeat? Do not all healthy minds welcome a difficulty, and are not difficulties members of the same family as those we call troubles?

We climb from strength to strength through battling with obstacles of every sort, by trying to see the beauty and benefit to be derived from them, and not by dwelling on the ugliness and pain alone. It is more helpful to be led to see a good purpose in pain than to be assisted in running away from it.

The craftsman feels he has to exercise his mind and moral sense until he has completely mastered his lower nature. He begins by training his hand. Do we not say of any fine work, we can see the master's hand in it? And do we not mean by that that we feel the mind of the artist has completely mastered, controlled and directed his hand? And that state of mastery, we all know, is mental law and order, imposing itself on the lower physical powers. In one word, obedience makes us free. Freedom of hand is the direct outcome of obedience and resignation—when hand says to mind, "Thy will be done."

Towards the building of our castle in the air, have we not, at last, got one stone—or call it one condition—the subjection of the physical to the mental, the elevation of mind over matter?

We are so dominated by matter, our bodies are so hard to get away from, that the building of our castles does not seem to flourish, and we are fearful that being of the spirit, they can have no practical use at all. Sometimes we are so contented and happy, our struggling is being done for us by countless societies and political parties; we really ought to be smiling all day long, so many wrongs are being set right for us. But we are a discontented lot. We still feel the lawlessness within, and our castle in the air will not get built. The party I am working for wants the wrong sort of service. My ideas are not understood nor appreciated, and how can I create any palace, hampered and hemmed in by the wicked wills of other men? So we may go on, counting up our excuses, and explaining the delay in our building. And no one is satisfied therewith. Then we remember we are the high priests of beauty, and beauty must be sought and found. If our material is mundane and sordid, we must not throw up our birthright; as castle builders we must not lose heart because our task is difficult. Have we not just acknowledged that the difficulties of our work are the measure of our successes? I deny that there is any work needed to be done in this world which necessitates the silencing of the moral sense or the stoppage of thought, the two universal, everlasting faculties, fidelity to which gives power, and which power is often called genius.

Thought and feeling, then, must be the mortar with which we bed and bond-in every stone of our castles in the air.

The province of art workers is not so much to symbolise what is lovely for the entertainment and enjoyment of man, as to win his heart to seek what is lovable.

The study of history teaches us that there is no finality in the culture of the human mind. So the ploughmen of to-day may be the dukes of to-morrow. Thus all mankind, from the least unto the greatest, are equally charged with the duty of self-culture and castle building; and we need to be ever mindful that the moral aspect of art is for our own culture and an example to others, rather than as a weapon wherewith to drive them. Beauty is to be held up for admiration and never forced down our throats.

In forming your judgment of the value of any work, you instinctively inquire into its moral worth. Does it appeal to your higher or lower nature? Does it appeal to your spirit, or to your flesh? And to what extent does it awaken your kindly and benevolent feelings? In making or creating anything, your first impulse is spiritual, that is, mental and moral; whether your impulse be benevolent or otherwise will determine your work's worth. You build your castle out of pure crystal thought, and colour it with love. And so may you foster and cherish your love of beauty.

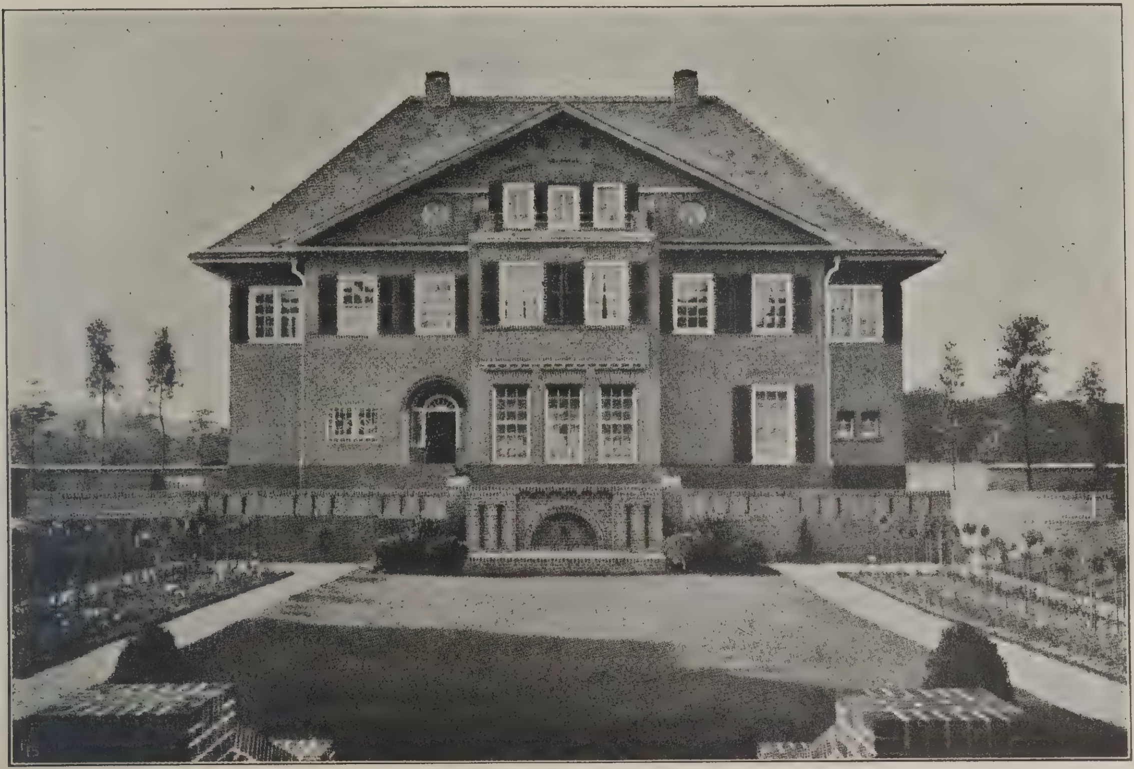
And this purely spiritual love of beauty may be as surely transmitted as the love of drink.

One man will express it in poetry, one in prose, one in music, one in crafts, and so on through all industry. Whatever be your tools matters little.

Carlyle said, "Rightly viewed, no meanest object is insignificant; all objects are as windows through which the philosophic eye looks into infinitude itself." And again,

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Dekorative Kunst.*

A BRICK HOUSE FOR HERR WALTHER von SCHEVEN, AT CREFELD.—Herr August Biebricher, Architect.

"All visible things are emblems; what thou seest is not there on its own account; strictly taken, is not there at all: matter exists only spiritually and to represent some idea and body it forth." In less ornamental language we may say, matter is merely the vehicle of thought and feeling, and only that particular part of things is worth fighting for. The most perfect material in the world is useless to us without the force of human will. We cannot, any one of us, make a beautiful world. But each one may build himself a beautiful castle, and in so doing cultivate that love of beauty that shall colour all his conduct, and in the course of ages make the world more beautiful.

We must keep up the longing for beauty, in all its forms, that is the best the human mind can imagine.

The desire must precede the acquisition; so let us build on, adding little by little to our castles in the air.

Being of the spirit, they occupy no space, and cannot be in anyone's way. We can blame no man for their defects; we can pull down, and rebuild, as improved ideas suggest themselves to us. We feel like creators, dealing with the infinite. We need no money for such building, for as Carlyle says, "Thus from poverty does the strong educe nobler wealth." We may use our work to refine and quicken our faculties, to purify character, not to please. Pleasure is only a consequence of right action and goodness. When pleasure is sought as an end in itself, it is poison. Emerson has said that "as soon as beauty is sought not for religion and love, but for pleasure, it degrades the seeker."

One of the most perplexing of questions is that one often asked by young craftsmen, "Ought we to do what is asked for, what is said to give pleasure, although we know it is bad?" And we may interpret the difficulty of the question to mean that we cannot be the guide of other men's conscience. Each must answer the question for himself. He who will make the biggest sacrifice for conscience sake proves, at least, the honesty of his belief, and sets a good example. What we can do, and ought to do, is to encourage each other to be strong.

Never appeal to each other's fear as a motive for action. Fear is a cruel taskmaster, and a destroyer of our sense of beauty.

If to please were the sole aim of all art, and happiness the aim of life, we should not feel any necessity for greater sensibility, because greater sensibility certainly involves greater pain and suffering. So it would seem we are not sent here to be happy, but to learn in what real happiness consists, and what it involves, and to be a blessing to each other.

We find that when people are bent on amusement and thoroughly abandoned to sensuous pleasure, their sense of beauty becomes dulled and materialistic, and they ask for nothing beyond fitness to material ends. Fitness we believe to be the true basis of all beauty. But the card-player, among others, stops there, and does not mind how ugly the card-backs are as long as they fulfil all practical requirements.

The pursuit of pleasure and the craving for ease are closely allied and lead to a materialistic state of mind that is not stimulating to a sense of beauty.

The fear of the ballot-box makes the councillor satisfied with the safe, hall-marked architecture, although vermiculated, that is, pitted all over to imitate worm casts, as if man's highest aspirations were to find expression in the imitation of the lowest orders of creation. This "ornamentosity" of architecture is like verbosity in literature, a poisonous excrescence.

But this is a digression. What I wished to do was not to denounce and scold, but to praise and encourage those forces we all have in common—those moral qualities which are as old as the hills, and more permanent, more stable than any matter. Matter for ever is changing; but the moral qualities are the materials with which the mind of man is for ever building, and beautifying his character and the world. And these qualities bring forth good fruit, under every conceivable condition, and in every country.

The most inspiring instances of the noblest powers of man have been seen in backwoods and amid squalor.

These same moral qualities are the most precious building materials, and the only ones of any use for our castles in the air. I think I hear the practical man ejaculate, "But they will not boil the pot!" Friend, if you think so, tell me what pot will boil without them. It is a grand world that is peopled with minds possessed of so many points of view. We help to keep each other from going to extremes.

My innings, to-night, is but a passing moment; time is behind me, preparing to cut down all folly and falsehood. Only what is true, and therefore beautiful, can survive its action.

But we are so impatient, we want to clear away all falsehood at once, to set everybody in order, according to our own ideas. And that is why we commend castle building. It is an antidote to impatience, and to the undue interference with others; its influence is gentle and persuasive, not violent or angry. We have to be looking everywhere for the beautiful and true materials. Every particle of our castle must be of the best. And in course of time we shall go to that storehouse of precious stones for the building of our earthly homes. Then "not a hut we build but will be the visible embodiment of a thought, and will bear visible record of invisible things. And in a transcendental sense, symbolical as well as real."

If we believe in the supremacy of law and order, then we have a bed-rock to build upon. It is the artist's business to discover what makes for law and order; what harmony means, and what are the possibilities and limitations of our materials and conditions, and to respect those possibilities and limitations as parts of the Divine plan.

We grow in strength as we recognise and obey Nature's law and order, and endeavour to harmonise our work with it.

And, on the other hand, the more lawless we become, the faster human laws accumulate, so much anarchy, so much grandmotherly legislation, and so many tyrannical schools of art.

Many will say we are trespassing; that the province of the artist is with material appearances; that he had better stick to his tools. But is this not carrying specialisation too far? Do you not, in so doing, make man into a machine, and rob him of the only source of heavenly light possible to mortals?

(*To be concluded.*)

## ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors to the above Society was held on Tuesday, the 8th inst., in the rooms of the Royal Institute of British Architects. Mr. Ernest George, A.R.A. (the President) was in the chair.

The Council, in submitting their sixtieth annual report, have to express regret that during the year under review, while the list of subscribers has suffered severely from the death of old members, only two new names have become enrolled among the members, viz., Mr. H. C. Corlette and Mr. Percy W. Lovell, while Mr. William Glover has doubled his annual subscription.

In the relief of cases 1,136*l.* 18*s.* 6*d.* has been disbursed, including 270*l.* paid to pensioners. The number of applications in which help was given amounted to ninety.

The income account shows excess of expenditure over income of 54*l.* 0*s.* 2*d.* The demands on this account were largely relieved by a special grant of 25*l.* from the Royal Institute of British Architects, by a special subscription of 20*l.* from Mr. H. Beswick (in addition to his usual subscription of 2*l.* 2*s.*), and by the sum of 47*l.* 2*s.* 8*d.* recovered from the income-tax authorities, being the rebate on two years' income.

The capital account has been increased by three bequests: Mr. J. W. Penfold, 100*l.*; Mr. Joseph Parkinson, 50*l.*; and Mr. N. S. Joseph, 25*l.* In addition to these sums the following donations have been received: Mr. John T. Christopher, 105*l.*; Mr. J. Macvicar Anderson, 10*l.* 10*s.*; Mr. Arthur Ashbridge, 10*l.* 10*s.*; Mr. J. Borrowman, 10*l.* 10*s.*; Mr. John Belcher, 10*l.*; Mr. Ernest George, 5*l.* 5*s.*; Mr. W. Hilton Nash, 5*l.* 5*s.*; Sir Lawrence Alma-Tadema, 5*l.* 5*s.*; Mr. W. H. Lever, 5*l.*; and some smaller amounts. Most of the above donors have from time to time made handsome contributions to the capital as well as being liberal annual subscribers.

In consequence of this addition to the capital the Council were enabled to increase the Society's investments by the purchase of 200*l.* Queensland 3 per Cent. Inscribed stock at a cost of 171*l.* 16*s.*, and 200*l.* New Zealand 3 per Cent. Inscribed stock at a cost of 175*l.* 16*s.*

Instead of meeting on undefined dates as hitherto, the Council have decided to meet on the second Tuesday in the months of February, May, July, October, and December, as well as before the annual general meeting in the second week in March, when applications will be considered and other business transacted.

In view of the diminution in the number of subscribers the Council would urge upon members to use their influence, on behalf of the Society, with all architects in active practice. As the aims and objects of the Society are, by advertisement and other means, brought prominently before the architectural profession repeatedly during the year, it is felt that the expense incurred in seeking further publicity would not be justified by the results. But it is essential, if the necessitous cases which come before the Council are to be adequately dealt with, that an effort should be made to secure the practical support of all architects who are in a position to contribute to the needs of their poorer brethren or to those whom they have left insufficiently provided for.

The following, being the five senior members, retire by rotation from the Council: Mr. Lacy W. Ridge, Mr. J. T. Christopher, Mr. J. Douglass Mathews, Mr. William Dunn, and Mr. Henry T. Hare. To fill the vacancies caused by these retirements the Council have the pleasure to nominate Sir Brumwell Thomas, Mr. Walter Cave, Mr. F. W. Hunt, Mr. Reginald St. A. Roumieu, and Mr. Lewis Solomon.

The thanks of the Society are due to the proprietors of the *Builder*, the *Architect*, and the *British Architect* for granting space for free advertisements in their respective journals.

The Council also desire to thank the Royal Institute of British Architects, both for generous contributions and for office accommodation, as well as the staff of the Institute for their willing assistance in all matters connected with the Society.

A vote of thanks to the retiring members of Council was proposed by Mr. H. L. Florence and seconded by Mr. C. H. Brodie.

In proposing the election of Council for 1910-11, Mr. J. Macvicar Anderson said that if each member of the Council would do his best to impress on his architectural friends the importance of the Benevolent Society much good must result. In the past this obligation and pleasure to further the interests of the Society had not been carried out properly. The motion was seconded, and the following were elected on the Council: President, the President of the R.I.B.A.; Vice-Presidents, Messrs. William Glover and Thomas M. Rickman; Council, Messrs. Benjamin Ingelow, Henry Lovegrove, Rowland Plumbe, William Woodward, the President of the Society of Architects, G. E. Bond, Arthur Ashbridge, Charles J. Blomfield, John Borrowman, C. R. Baker King, Sir Charles A. Nicholson, Bart., Sir Brumwell Thomas, Walter Cave, F. W. Hunt, Reginald St. A. Roumieu, and Lewis Solomon.

Mr. E. T. Hall moved a vote of thanks to Mr. W. Hilton Nash (the Hon. Treasurer) and proposed his re-election. Mr. Henry T. Hare moved a vote of thanks to Mr. Percivall Currey (the Hon. Secretary) and proposed his re-election. This was carried in both cases.

Votes of thanks were passed to Mr. H. P. Burke Downing and Mr. A. Saxon Snell for their services as the retiring auditors. Mr. A. Saxon Snell and Mr. C. H. Brodie were elected auditors.

In conclusion, a vote of thanks was passed to the R.I.B.A. for the use of the rooms, and to Mr. Ernest George, A.R.A., the Chairman.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) devotes itself to the illustration of the Shelby County Court House, Memphis, Tennessee, a fine pure Classic building designed by Messrs. Hall & Rogers.

*La Construction Moderne* (Paris) gives several views and a block plan of the Drouhet hospital at Cholon, Cochin-China, of which M. Josse is the architect.

*Der Architekt* (Vienna) illustrates a competition design for the town theatre at Brüx, by Herr Marcell Kammerer; a "new-art" project for a block of business offices at Brünn, by Herr Heinrich Ried; another for the Laibach Credit Bank at Laibach, by Herr Franz Krasny; a study for a water tower by Herr Rudolf Perco; a charming old interior courtyard at Linz, and two of Mr. Baillie Scott's designs.

*Berliner Architekturvelt* (Berlin) makes its current number practically a monograph on a remarkable venture of Messrs. Keller & Reimer, who have changed a flat dwelling in the Potsdamer Strasse into a show house of the latest things in German "new art," as applied to internal decoration and furnishing. Professor Bruno Schmitz has designed and carried out the entrance, vestibule and grand reception room on the ground floor, and numerous artists, architects, painters and sculptors have co-operated in the design of internal architecture and furniture for the various rooms. Thus we have here collected the work of the representative most modern German artists in the sphere of internal domestic architecture.

*Engineering Record* (New York) contains an interesting and useful account of a series of tests of concrete columns made under building conditions, the columns being of three types, plain concrete, longitudinally reinforced, without and with spiral hooping in addition. These tests were made by H. C. Berry, Assistant Professor of Materials of Construction in the University of Pennsylvania.

THE Newport Corporation are considering the expenditure of 17,255*l.* on alterations, &c., at their electricity works, and of 14,000*l.* on the extension of mains.

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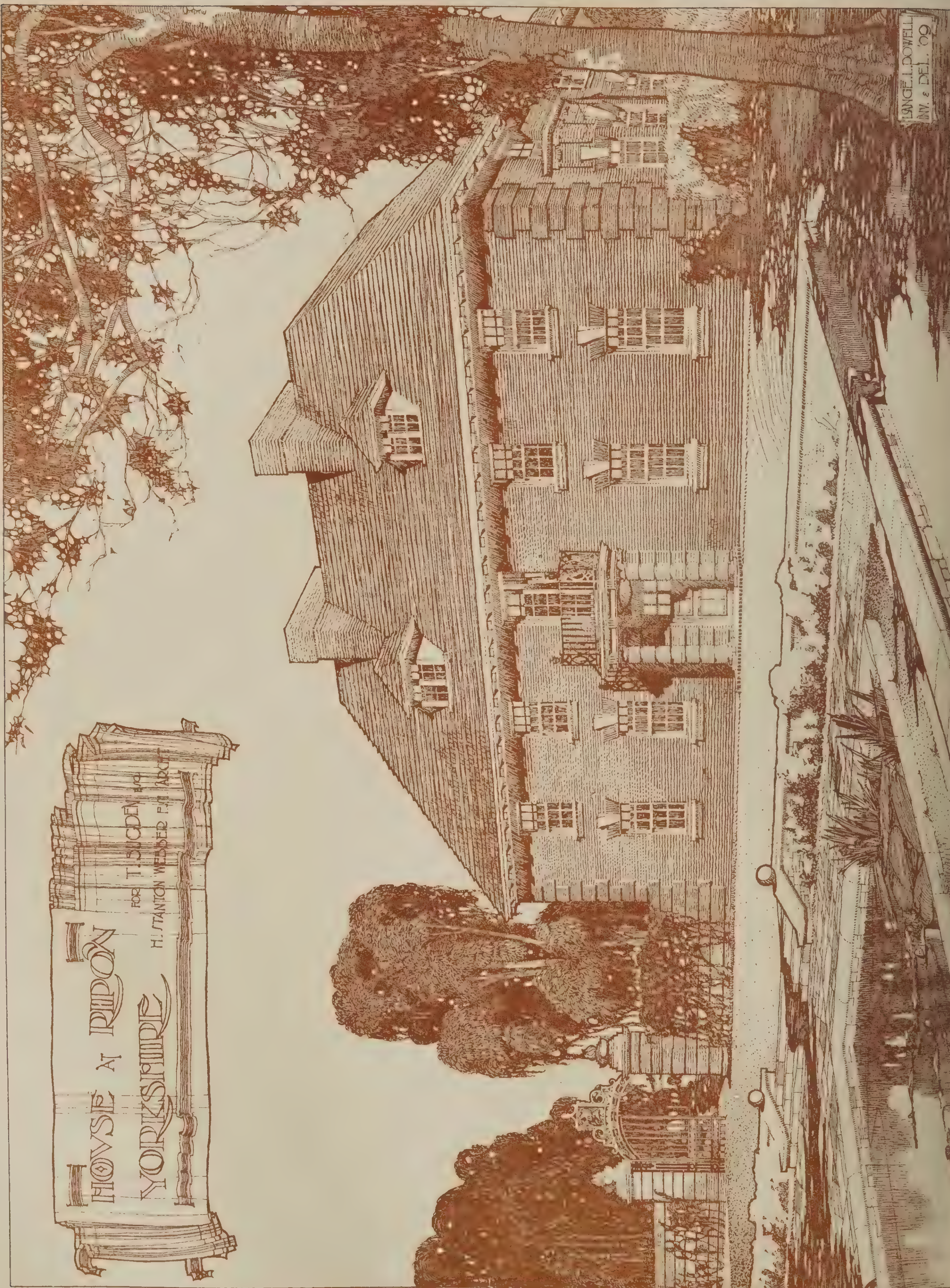
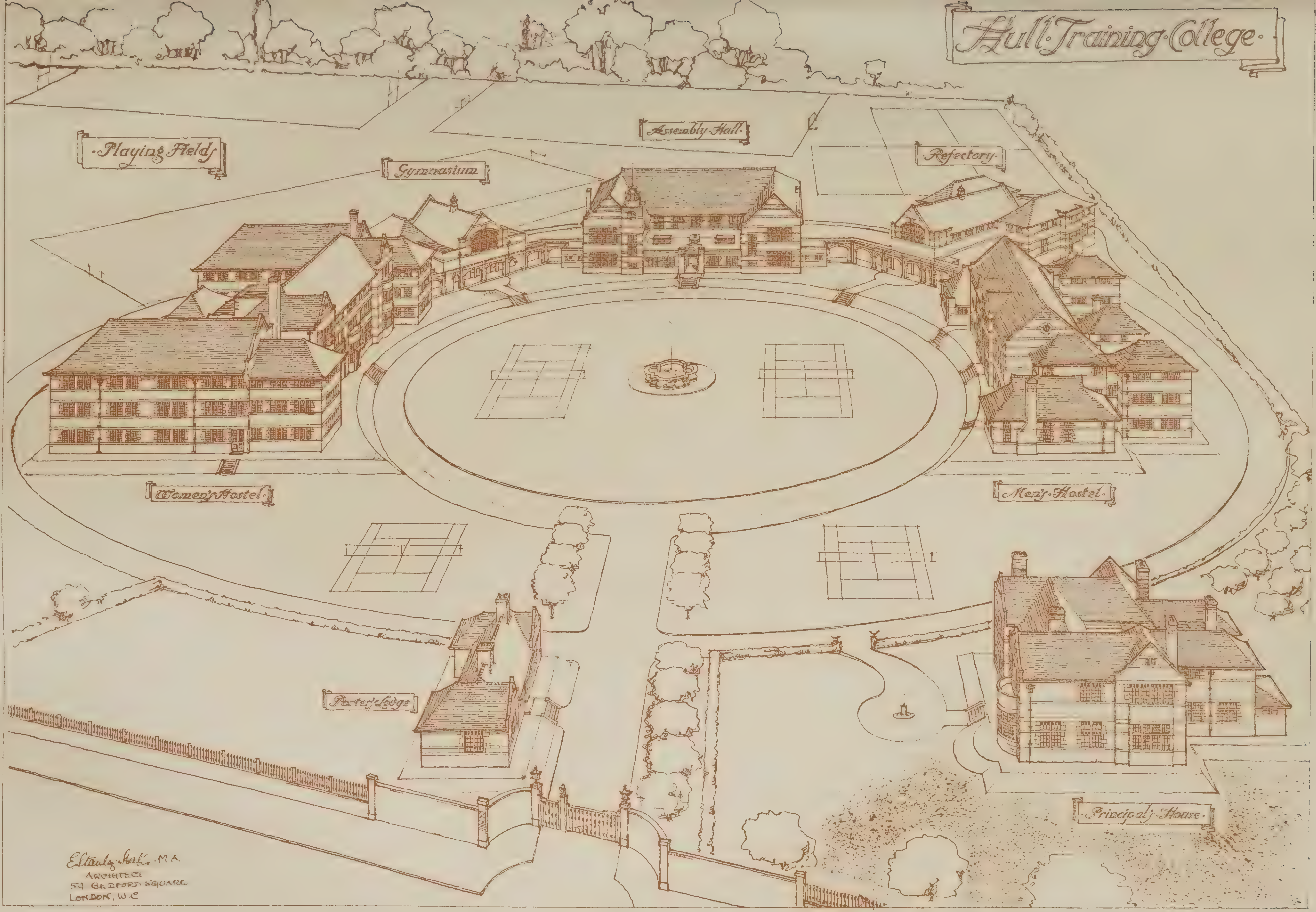
The Architect, Mar: 11th 1910.





COMPETITION DESIGN FOR HULL TRAINING COLLEGE.

By Mr. E. STANLEY HALL, M.A.

UNIVERSITY OF [illegible]

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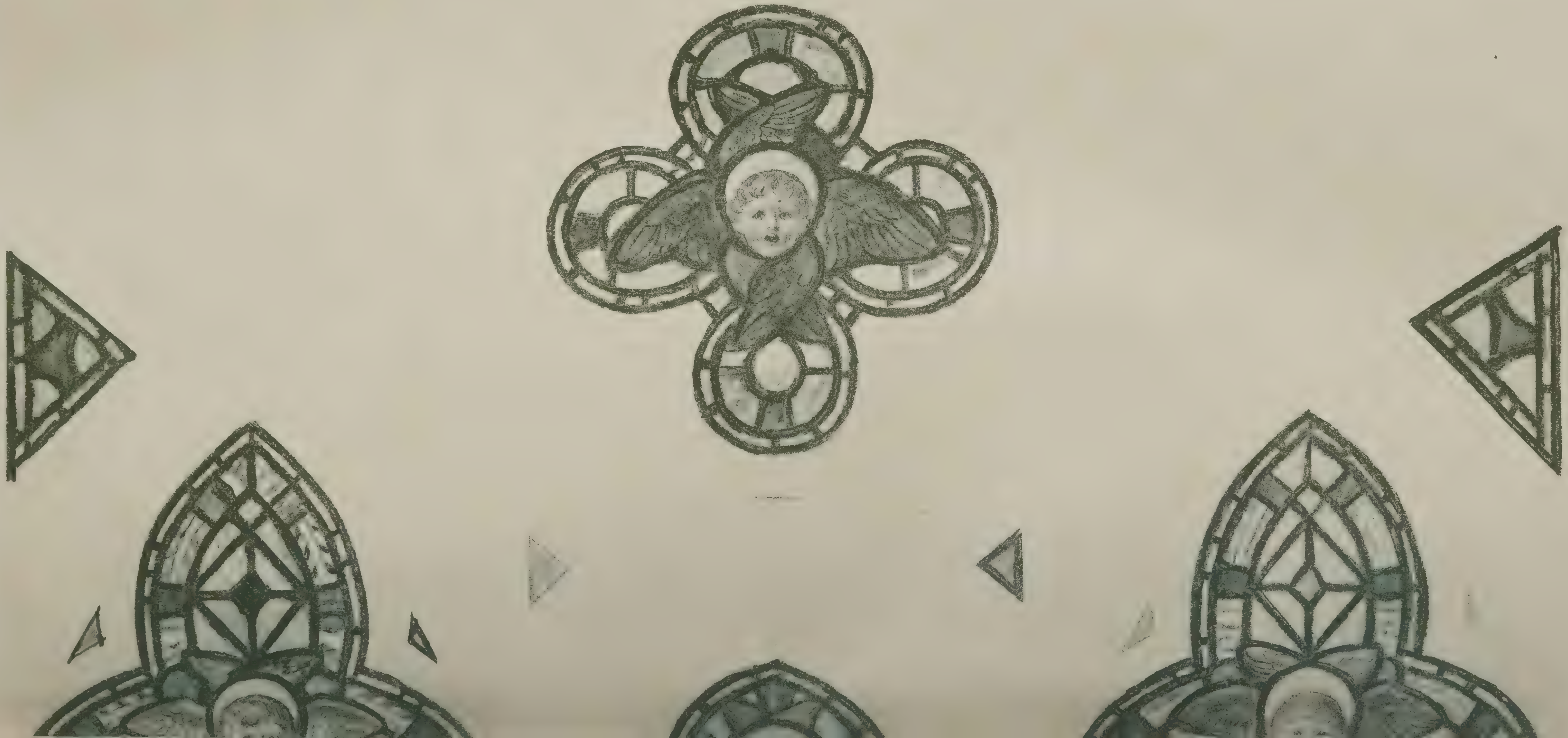

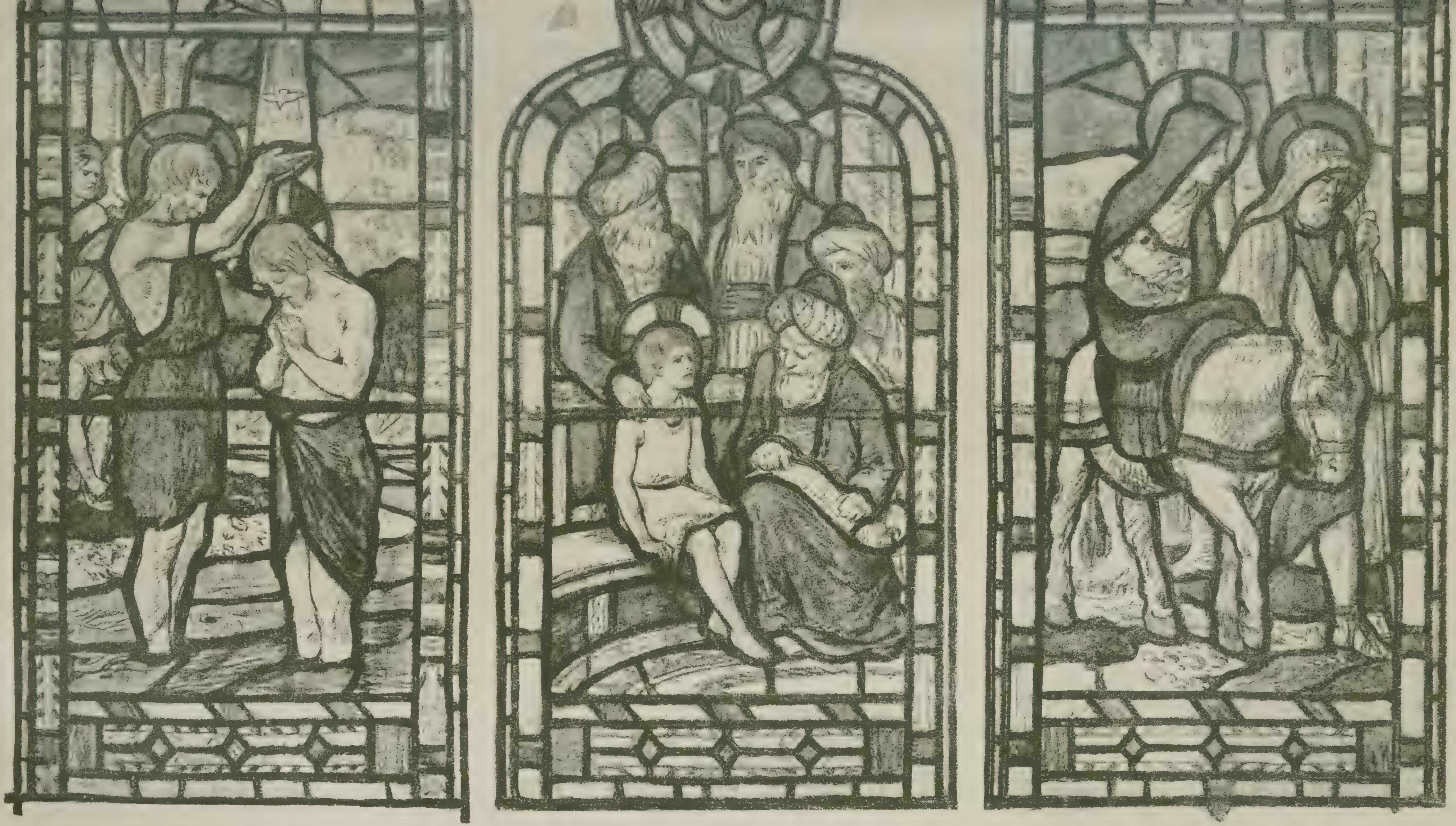

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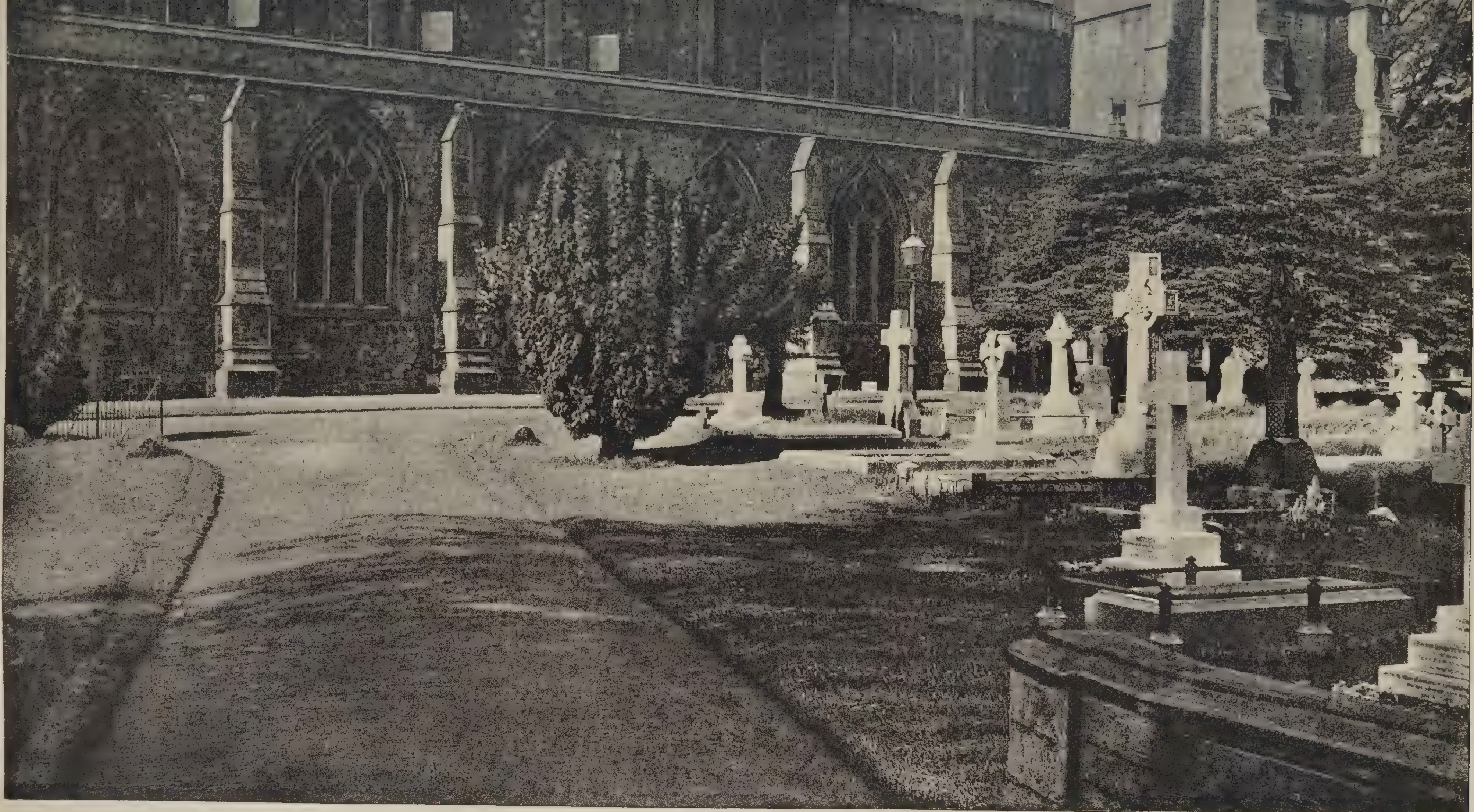

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# The Architect.

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## FORTHCOMING EVENTS.

*Friday, March* 18.

Architectural Association : Paper on "Filippo Brunelleschi and the Renaissance," by Professor Beresford Pite (Nomination of Officers).

Leicester and Leicestershire Society of Architects : Paper on "Influence of Classic Revival in Leicester," by Mr. A. Herbert, A.R.I.B.A.

*Monday, March* 21.

Institute of Sanitary Engineers : Discussion on The Housing and Town Planning Act, to be opened by Mr. P. M. Fraser, A.R.I.B.A.

*Wednesday, March* 23.

Edinburgh Architectural Association : Paper on "Plaster Decoration—principally Handwork," by Mr. Thomas Beattie, sculptor.

Carpenters' Company : Paper on "Coloured Reliefs and Mosaic," by Mr. R. Anning Bell, R.W.S.

*Thursday, March* 24.

Architectural Association : Camera and Sketching Club Excursion to Warwick till March 28.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ALTHOUGH the number of those joining in the work of the club for February is not quite so large as for January, we are very pleased to recognise that a general high standard of excellence is reached and we have had some difficulty in deciding upon the best work contributed. As a guide to our members in the future, we may define the principal points that weigh with us in the consideration of the merits of the several sets of measured drawings that we receive. These are: judgment in selection of subject, importance and magnitude of the work measured, thoroughness of the study, and finally draughtsmanship.

Judgment in selection is shown by preference for work that is good and excellent in design, for old work varied in this quite as much as modern work. Doubtless much of the bad design of the past has vanished because it was allied with jerry-building, or at least poor construction, for these faults are by no means confined to modern times. Although the present existence of buildings erected centuries ago usually connotes good construction, sufficient evidence has remained to our own day to prove that in the Middle Ages men did not always build well.

On the other hand, good construction then, as now, has not infrequently been accompanied by poor design, and students must be careful to remember that because a building is old it is not necessarily excellent architecture or worthy of study. Naturally a student in his early days is not to be expected to possess an unerring judgment, but as one side of his training he should endeavour to improve his critical faculty and ask himself before starting to measure any old building or piece of detail whether it is good in design. In this way he will form the habit of recognising and appreciating excellence and of detecting and condemning inferiority. One golden rule should be observed by every student whilst his judgment and taste are in process of development—never to devote valuable time to the study of that which is merely odd and eccentric.

Although, as we have said, we take into consideration the importance and magnitude of the work measured by our students, we give more credit to thoroughness. It is far better to make a thorough and careful study of a door or a window than an incomplete measurement of a cathedral. One very general omission in the drawings sent in for our first measured subject is that of diagonal measurements. It should never be assumed that an old building is rectangular either as a whole or in parts. There may be, and often are, irregularities due either to accident, or intention. Nothing, therefore, should be taken for granted. The same care should be given to determining the centres of circular curves. Mediæval arches often have their centres above or below the apparent springing. Centres of circles, whether in the arches or in tracery, can always be found by measuring two or more chords and the rise of the curve on a perpendicular from the centre point of the chords.

Another important point in the measuring of old work is the careful and complete study of the mouldings. These should always be measured and plotted full size on the spot, so that they may be recorded with the utmost accuracy of which the student is capable. When finished drawings are made, if full sizes are for any reason of space considered undesirable, mouldings should not be drawn larger than one-third full size, and often one-quarter is preferable. Half full size should be rigorously avoided as it tends to create wrong impressions. When mouldings of any piece of detail are drawn out they should all be to the same scale, otherwise it is almost impossible to judge of their correlation, which it is most important to understand. In any satisfying piece of architecture there must be harmony between the mouldings of its several parts. Arch-moulds, caps and bases must not be considered as separate and distinct entities, but as closely related parts of one organic whole. Only thus can harmony of feeling be preserved in design.

As regards draughtsmanship it must be remembered that a measured drawing is a diagram of architectural work as it is, not a picture of it as it looks. Accuracy and clearness of expression with completeness of record are, therefore, far more important than effectiveness of representation. A sketch is a memorandum of a thing either as it is or as it looks; a measured drawing should be a working drawing and the record of the means by which the effect of a particular piece of architectural design is obtained. Precision and completeness are therefore essential.

Whilst we are pleased to welcome amongst our February students several new workers, we regret that some of those who sent drawings in January have not again contributed, and particularly we miss the names of some of those who did excellent work at the first essay.

It is with the object of encouraging continuity and perseverance that we offer a studentship, as well as a monthly prize, and the winning of the studentship may be the reward of an aggregate of good work, although this may not necessarily be fortunate enough to win a single monthly prize.

Following our former procedure, we give our criticisms on the drawings submitted in a sequence that does not imply the order of merit.

"Kingdom" sends an interesting set of drawings, well executed, of the chancel and apse of the church at

Leuchars, Fifeshire, a rich example of Late Norman work, the character of which would agree with the date that the author gives us of the time, 1187 A.D., at which a record remains of the existence of a church. This, however, is not the thirteenth century. The seventeenth century tower which now exists is not shown by the draughtsman, who instead has "restored" the old roof. The plans are not figured, although it is advisable on measured drawings that the dimensions should be given. The mouldings are sensibly drawn one-quarter full size.

Mr. Harry Collings contributes a measured drawing of the south door at the church of St. Peter, Thurgarton, Notts, a well-chosen and well-drawn example, with the joints, as they should be, carefully shown. Figured dimensions also are given, so that Mr. Collings has in several respects done the right thing. He has, however, made a mistake in drawing some of the mouldings half full size and some full size on the same sheet. In the design the composition of the arch mouldings with a counterchange in the orders is worthy of note. The treatment of the caps is peculiar and inferior to the more usual method of grouping each order of the arch with its individual support.

Mr. Kenneth A. Cockrill has measured the two middle bays of the east walk of the cloisters at Norwich Cathedral and has made a commendably careful study of the vaulting and its construction. The bosses, however, should not be indicated in such work by simple circles, but by the form of the stones of which they are constructed, failing the accurate representation of their carving. Mr. Cockrill's delineation of mouldings is not sufficiently careful and accurate, whilst his drawing of the tracery is also somewhat wanting in precision.

Mr. Bernard J. Mendham has drawn the east window of the church of St. Giles, Sheldon, Warwickshire, built in 1291. The window is in five lights and is a good example of the Decorated period as it had developed at the end of the thirteenth century. Mr. Mendham has erred in drawing some mouldings one-quarter and some one-half full size, whilst his section of the arch moulding does not appear to us to be quite accurate.

Mr. Stanley E. Minns contributes two sheets of well-executed drawings of the doorway in the south transept of Beverley Minster, Yorks., but he has not fully shown the jointing.

"Nelson" illustrates one bay of the north aisle of the parish church of Mold, North Wales; but as this is Perpendicular work it can hardly be considered of thirteenth century date. The author should avoid back lining in measured drawings and must aim at accuracy and precision in draughtsmanship rather than the false effectiveness that back lining produces.

Mr. Charles T. Whiteley has measured the doorway in the north aisle of Bolton Priory, Yorkshire, and his drawings have the merit of figured dimensions and careful measurement of jointing with good drawing, except in the mouldings, which to one-quarter full size are not sufficiently accurate.

"Sans Peur" has drawn the south porch of the church of the Holy Cross, Ryton-on-Tyne, a somewhat peculiar example of Early English work. The drawing is well executed and the jointing fully shown, but no dimensions are figured.

Mr. Reginald Pywell sends good drawings of the retro-choir at St. Saviour's Cathedral, Southwark, commendably figured, save that no diagonals are given, and with the mouldings full size.

"Esek" gives us an excellent drawing of the lower part of the west front of Bolton Abbey, Yorkshire, with some full-size mouldings, but not a sufficiently complete series.

Mr. H. A. Welch has measured and drawn the west doorway of the church of St. John, Kirkburton, Yorkshire, a not very remarkable subject and scarcely worth the trouble of study. Mr. Welch makes the mistake of drawing mouldings half full size.

Mr. F. D. Browne and "Ambo" have improved upon the work they sent in January, but "Tyke" and "Precentor" have yet to learn that carefulness and cleanliness are amongst the first essentials of an architectural draughtsman.

We have awarded the prize for February to Mr. Reginald Pywell, and consider that in point of excellence his work is very closely approached by that of Messrs. K. A. Cockrill, H. Collings, F. M. Craik, B. J. Mendham, S. E. Minns, C. T. Whiteley, "Esek," and "Sans Peur."

With the purpose of giving our students an opportunity for work during the Easter holidays, we have extended the date for sending in their drawings for the March subject to Thursday, March 31.

We also make the preliminary announcement that the subject for June will be an example of woodwork, executed during the fourteenth or fifteenth century, in an ecclesiastical building erected in Great Britain or Ireland.

## NOTES AND COMMENTS.

The Building Committee of the Welsh National Museum met the assessors at the office of Mr. E. T. Hall on Thursday in last week, when the unanimous decision of the assessors was presented in their report to the Building Committee, who in turn unanimously adopted it for recommendation to the Council at the meeting which we understand is to be held to-day.

The long-delayed application of the gift of the late Mr. Usher of 100,000*l.* "to provide a hall that should be a centre of attraction to musical artists and performers and to the citizens of Edinburgh and others who may desire to hear good music," and for the purpose of "promoting and extending the cultivation of and taste for music," appears now to be on the point of fruition, for at a meeting of the Lord Provost's Committee of Edinburgh Town Council on Wednesday in last week it was resolved—

> That the magistrates and council proceed forthwith with the erection of a new hall under the late Mr. Usher's gift, to contain seating accommodation for 3,500 persons, including the orchestra, on the site belonging to the corporation between Castle Terrace and Lothian Road, extended to include the site of the Lothian Road School and the tenement properties between the corporation property and the Lyceum Theatre.
>
> Remit to the committee to negotiate for and acquire the school from the School Board, and the remaining tenement property, and to apply for powers of acquisition in the Provisional Order about to be promoted by the corporation.
>
> That, in consideration of the redemption price being applied wholly in or towards the execution of the corporation statutory powers in connection with the hall and site, the magistrates and council resolve and agree to redeem the 102,900*l.* of Edinburgh Corporation 2½ per cent. stock (redeemable at par after 1927) held by them on behalf of the account for Mr. Usher's donation, at a total price of 101,613*l.* 15*s.*, being the price originally paid to the corporation for the same; and upon such redemption, to cancel and extinguish the amount of stock so redeemed.
>
> That the total sum to be expended on the acquisition of the site (exclusive of the existing Synod Hall) shall not exceed 40,000*l.*; and that the estimated cost of the erection and completion of the new hall and its adjuncts shall not exceed 70,000*l.*, but the contractors' offers, when obtained, to be submitted to the magistrates and council for approval and acceptance.
>
> That the plans of the new hall and offices shall be obtained by open competition; and that Sir Aston Webb, R.A., London, shall be the assessor to adjudicate upon the plans submitted, with Mr. James A. Williamson, city superintendent of works, associated with him. Remit to the committee to adjust the conditions of competition, and the premiums to be paid.

The Departmental Committee appointed to consider the question of materials and construction of school buildings has led to sundry questions in Parliament suggestive of an enlarged scope of the reference to the committee.

Mr. Charles Bathurst inquired of the President of the Board of Education whether the terms of reference to the recently appointed Departmental Committee on school buildings were intended to include the consideration of what was the best type of building for an elementary school and what was the best internal arrangement of classrooms, cloak-rooms, and offices, bearing in mind not merely present convenience, but also the possibility of future extension; and, if not, whether, in view of the differences of opinion amongst school architects and their occasional lack of foresight in these matters, resulting in increased expenditure on the part of local education authorities, he would specifically widen the terms of reference so as to include this consideration?

---

The President of the Board of Education replied:—"I purposely restricted the reference to the Departmental Committee to materials and methods of construction in order that this small committee might be able to deal with the matter expeditiously. I think it would not be at all in the interests of local education authorities that I should extend the reference so as to include the whole question of school planning, which is very complicated. As regards school architects, I am disposed rather to welcome than to discourage differences of opinion, and in the interests of progress, which involves a certain amount of experiment, I should be very reluctant to prescribe any type or types of school building as the best."

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Sir John Rolleston asked whether, in regard to the Departmental Committee lately appointed to inquire into the cost of public buildings for schools, &c., he will consider the advisability of adding to the Committee the names of one member each of the Councils of the Royal Institute of British Architects, the Surveyors' Institution, and the Institution of Civil Engineers?

---

Mr. Runciman replied that he purposely restricted the membership of the Committee in order that it might be able to report quickly. It is not intended to be a committee of experts who could authoritatively recommend particular materials or methods of construction for adoption by local education authorities. The practical question which lies behind their reference is whether the Board of Education can properly modify their building regulations and entertain or encourage proposals from the local education authorities who are primarily responsible for school buildings for the adoption of new materials and methods, and if that question is decided in the affirmative, what further arrangements are necessary to give effect to the decision? He thinks a small committee of administrative officers collecting the best expert opinion on the subject, which he hopes will be placed at their disposal by the great bodies named in the question, is the best body to deal with the matter from the point of view which he had indicated.

---

Lord Claud Hamilton asked the First Commissioner of Works last week whether he would consider the expediency of removing the painted wood boarding which had for so many years disfigured the stone screen facing the entrance to the Admiralty in Whitehall; and whether he could hold out any hopes of the completion of the towers of the Home Office in Whitehall in accordance with the design of the architect?

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Mr. Harcourt replied that he would consider the first matter, but the cost would be considerable, and he was not prepared at the moment to incur it. He much regrets that financial exigencies will not permit him to undertake the completion of the towers at present.

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The awakening interest of the public in town planning no doubt led Mr. Ponsonby to inquire of the Lord Advocate whether any scheme of developing the residential quarter of the naval base at Rosyth on garden city lines is to be undertaken by the Scottish Local Government Board.

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Mr. Ure, in reply, stated that he understands the Admiralty are proposing that a certain area of their property at Rosyth should be developed on garden city lines. A conference has been held between the representatives of the Admiralty and the Scottish Local Government Board in order that the Admiralty may be advised as to the best means by which the scheme can be carried out.

## CHURCHES AND CLOISTERS IN PORTUGAL.*

*(Continued from last week.)*

### *Alcobaça.*

Between 1150 and 1160 was commenced the erection of the church and monastery of Alcobaça by the first real King Alfonso Henriques, in fulfilment of a vow that he would found such an establishment if successful in an attack upon Santarem, a city held by the Moors, about twenty-five miles away. The church is distinctly French Romanesque in character. It is the largest church in Portugal, internally 365 feet long by 72 feet wide by 155 feet across the transepts and 68 feet high over nearly the whole of its area.

Comparing this with Durham Cathedral, I find Alcobaça to be almost exactly nine-tenths of the size of Durham (exclusive of the Galilee chapel).

The nave has no less than thirteen bays with north and south aisles. The transept has an aisle on the west side and chapels on the east side. The choir has one bay. Then comes the apse with its ambulatory and series of surrounding chapels beyond. The whole church, except the chapels, is of the same height, 68 feet, so that there is no triforium or clerestory, the lighting being by windows high up in the aisle walls, the transept ends, and west gable and apse. There is a little chapel on the west side of the south transept to which I will refer later.

Being built for the Cistercian Order, the church is exceedingly plain in its design and details, as was enjoined by St. Bernard, the founder of that Order. The buildings were in progress more than sixty years, the monks taking possession of the conventual buildings in 1223. The monastery was very rich, and is said to have accommodated 999 monks.

ALJUBAROTTO.

A horrible reredos and other rococo fittings at the east end were put in during the seventeenth or eighteenth century, probably at the same time as the west end was rebuilt, as we see it in the Jesuitical Classic garb it now presents. Only the great west doorway is left to indicate what once was.

Entering the church through such a façade, one almost gasps with astonishment to find oneself inside what is practically an early French interior of the large dimensions and stern detail and proportions I have before referred to.

I have already mentioned the little chapel to the west of the south transept. This is a mortuary chapel, probably built about 1310, and contains many tombs of interest, including that of Queen Beatrice, who died in 1279; but it has clearly been second-hand and made for someone a century and a half earlier.

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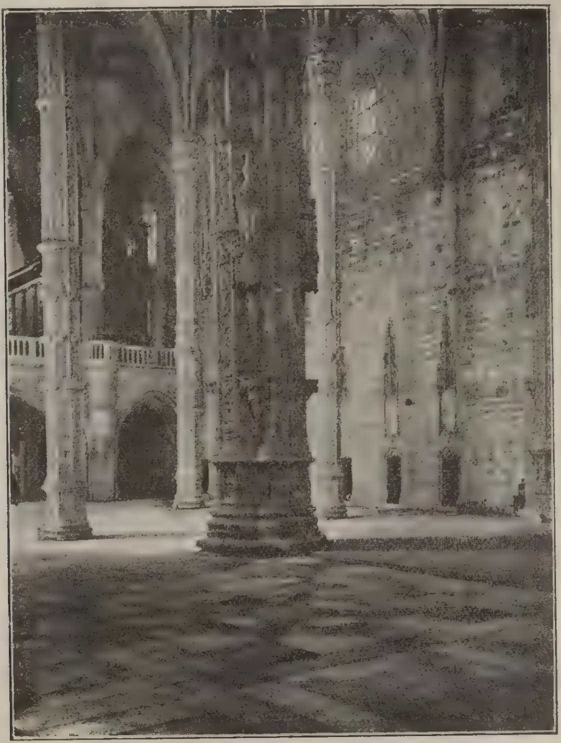
* A paper read before the Northern Architectural Association on March 2, by Mr. Joseph Oswald, F.R.I.B.A.

The most interesting tombs are those of Pedro I., who died 1367, and of his beloved mistress and post-mortem queen Inez de Castro, who was murdered twelve years previously, placed not side by side as usual, but foot to foot by order of the king, so that his first sight at the Resurrection might be his beloved Inez face to face. Their romantic story is too long to be told here.



BELEM—INTERIOR, LOOKING WEST.

The delicate and beautiful details of these tombs are quite French in character, and, alas! sadly damaged by the French soldiers in 1810, who broke them open and scattered their contents. The stone is local, very like Caen stone, soft when quarried and easily carved, but hardens by exposure to the atmosphere.

There are beautiful figures of angels supporting the effigies, dogs at the feet, &c.

The great cloister to the north of the church was begun in 1310, as an inscription tells. In the centre of the north side projects an apsidal building with two tiers of windows, quite French in character and looking more like thirteenth century than fourteenth century work. This is the lavatory or fountain house. The remainder of the cloister exhibits a mixture of trefoil-pointed segmental and trammelled arches, with something like plate tracery in the tympana of the lower storey. The upper storey was added in 1518 in the Manueline style. The fountain has some lovely Renaissance detail round the basin.

The door leading to the sacristy from behind the apse is a late Manueline insertion, and reminds us of some of the work we saw at Thomar and shall see elsewhere later. The plain wall surface in which it is set acts as a foil to its richness and has the dado of blue and white glazed tiles which occur at so many places in Portugal. In the north of Portugal (Oporto and neighbourhood) many modern houses are completely faced externally with glazed tiles. The domestic buildings are very extensive and are now used as barracks.

### *Belem.*

Belem (*i.e.* Bethlehem) is now a suburb of Lisbon, about four miles down the river Tagus from the centre of the city. Not far from the river stands the great monastery of the Order of St. Jerome (hence called "Jeronymos"), commenced by King Manuel in 1500 as a thankoffering for the safe return during the previous year of Vasco de Gama after his successful voyage to India and back.

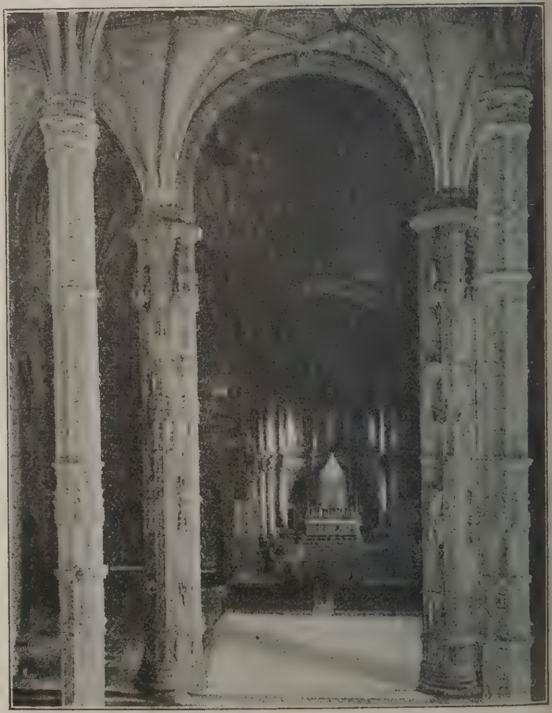
The plan is cruciform. The nave is of four bays and has north and south aisles of equal height with the nave itself. At the west end of the aisles are oblong towers, and the space between these towers, together with the westernmost bay of the nave, is divided in height into two storeys, the upper one forming the coro like that already described at Thomar, but in this case retaining its stalls and organ.

The nave and its aisles from the west wall of the church to the transept is 165 feet long by 77 feet wide and at least 80 feet high. The spacious transept measures 95 feet by 65 feet, and rises higher than the nave and its aisles owing to the greater span of the vault, which is said to be the largest attempted since the days of imperial Rome. It is remarkable that it should have withstood the great earthquake of 1755, especially as its western edge is supported on columns and two only of these. From the ends of the transept project narrower rectangular chapels, and to the east is the chancel, which is later than the rest of the building, the previous one said to have been pulled down almost as soon as built and replaced by the present poor Classic design in 1551.

Externally the church is not at all impressive. The petty little cupola on the south-west tower is quite modern. The great features are the south and west portals. The south door is characteristic of the Manueline style, and may be compared with that we have already seen at Thomar, though it lacks, I think, the latter's refinement. This is perhaps partly due to the stone here being of a coarser nature, and therefore not lending itself to such delicacy of detail. The portal is divided into two doorways by a column which supports a statue said by some to be Prince Henry the Navigator, by others Vasco de Gama. Right and left are twelve Apostles; above the door the Blessed Virgin Mary, to whom the church is dedicated, and twelve other saints, and over all St. Michael the Archangel.

The west portal is less elaborate, but quite as characteristic of the style. It was designed with a narthex outside of it, now non-existent. The sculpture includes King Manuel and his Queen Maria kneeling right and left, the Annunciation, the Nativity, and the Adoration of the Magi.

Internally the general effect is one of great spaciousness, and the eye is at once attracted to the slender columns (nearly 70 feet high and only about 3 feet diameter) dividing the nave from its aisles, all of equal height. The absence of anything like an arcade upon the columns gives the effect of a vaulted hall rather than a church with nave and aisles The two columns at the junction of nave and transept are only about 6 feet diameter. All are covered from bottom to top with carved foliage and arabesques, except where canopied niches for statues occur. The capitals are not strongly defined, and the ribs of the vaulting rise from the top of the column like the fronds of palm trees.

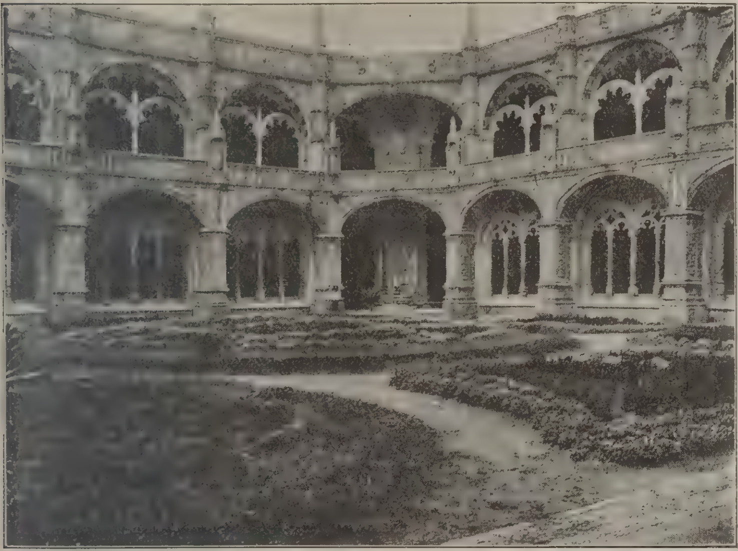


BELEM—INTERIOR, LOOKING EAST.

It is interesting to note that the work is just about co temporaneous with Henry VII.'s Chapel at Westminste Abbey.

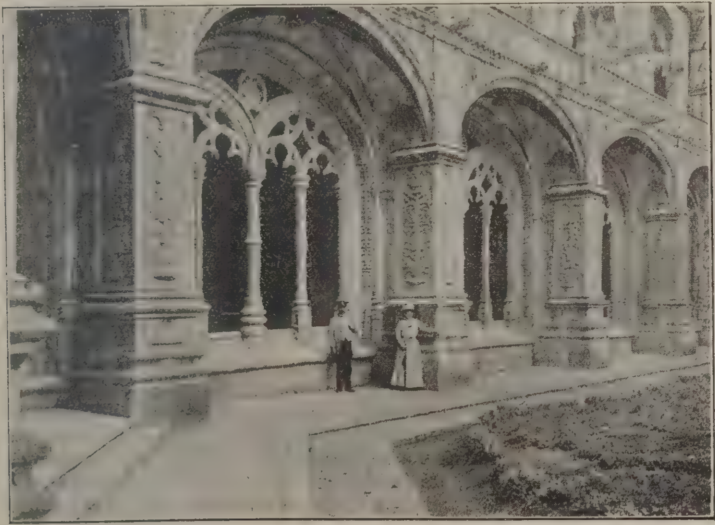
In the view looking westwards we see the raised coro the west end with its gallery front towards the church, i stalls and organs. In the north wall of the church are series of confessionals arranged with doors from the church (for the penitent) and from the cloister (for the priest) alternately.

The cloister on the north side of the church is about 180 feet square, and is celebrated for its elaborate ornamentation, which can hardly be described. It is an extraordinary, yet not inharmonious, mixture of Manueline and Renaissance detail, and it has been suggested that the panelled pilasters and arches which exhibit the later details may have been grafted on to earlier work to strengthen it. The fountain in the north-west angle is not so elaborate in itself or its surroundings as at Alcobaça and Batalha.



CLOISTER AT BELEM, LOOKING NORTH-WEST.

The Manueline tracery in the windows of the lower cloister is full of interest and will bear the closest scrutiny. The tracery in the upper windows does not strike one as ornamented construction, but as constructed ornament. I cannot help thinking it is not part of the original design.



CLOISTER AT BELEM.

The refectory has good groined vaulting of a very flat pitch and a dado of azulejos or glazed tiles.

The dormitory above the refectory has similar vaulting. Both are now in use in connection with a boys' orphanage, to which the buildings have been allocated since the suppression of the monastery.

The chapter-house and sacristy are on the east side of the cloister. Both have interesting groined vaults.

*(To be continued.)*

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute was held at Conduit Street on Monday, March 14, when the chair was taken by Mr. Ernest George, A.R.A. (President).

Mr. H. T. Hare announced the decease of the following members:—Mr. George Thomas (F.), elected in 1901; Mr. H. Jarvis (F.), elected in 1878; and Sir Thomas Drew, the distinguished President of the Royal Hibernian Academy. Sir Thomas Drew was Doctor of Laws, Dublin University; elected Fellow of the Institute in 1889; past president of the Royal Institute of Architects of Ireland, and represented that body for some years on the Council of the R.I.B.A. His many distinctions indicate his versatility and the range of his accomplishments. He had always taken an active interest in the cause of architectural education, and had recently been appointed to the chair of architecture at the National University of Ireland. A vote of sympathy to the relatives was passed unanimously.

Mr. Alfred A. Hudson (H.A.), barrister-at-law, then read a paper dealing with—

### The Business Side of Architecture.

Mr. Hudson said he approached the subject with diffidence, but also with the knowledge that he had once been in practice himself, that he had for twenty-five years acted as counsel in building and engineering cases, and that he had also gained experience as a building owner.

The growing custom of the young architect receiving his education in a school instead of in an office rendered it imperative that the training in the former should be as practical as it used to be in the latter. The scheme drawn up by the Board of Education expressly said that the two-year course given in the schools should be limited to a thorough training in the ground-work of architecture, and that it should be followed up by two years as pupil-improver or assistant in an architect's office with supervision by the Board. They recommended five subjects for the school:—(1) Building materials; (2) construction; (3) drawing; (4) architectural form; and (5) ancient architecture. Simultaneous training in the workshop or laboratory was considered essential, with visits to buildings in course of erection. Excellent as this course was, Mr. Hudson contended that it hardly emphasised enough the practical part of the profession, and in that respect it fell short of the old-fashioned pupilage. The school course rather ignored such subjects as planning, preparation of specifications, measuring, and estimating. With the present system the pupil, if he started in practice, would have had no business training, besides being entirely without experience in the performance of the professional duties cast upon him under an ordinary building contract.

The Architectural Association School of Architecture follow those recommendations and give the student knowledge of architecture, of art, and even science, but nothing to fit him to put into practice that knowledge or to bring it on to a business footing except some lectures in the last year. Instruction as to the cost of building, or the relation of design to cost, or the application of art to practical everyday work, is absent. Whether the student likes it or not he must prepare to be an art architect and give up all other training for that one object. The lectures at the evening classes only in the final fourth year deal with business matters. Then there is apparently one lecture for each of the ten subjects. But what can a student learn from one lecture, on, say, the London Building Act? No doubt the building owner in general would much prefer that the design should be artistic; but of still greater importance are such matters as proper planning, a complete and well thought out specification of the work to be done, and an accurate forecast of the cost. Instruction in planning was recommended by the Board of Education, but it does not appear in the A.A. syllabus. Yet the subject should be taught most thoroughly. A young architect ought to be instructed in the objects of planning under such heads as the comfort and requirements of the occupants, the economic working of the management, and so on. The first essential in house planning is good arrangement, the second is design. Another matter for instruction is to teach the student how to make a well-designed exterior for a properly planned building. The study of ancient architecture, modelling, material, and construction has no doubt produced a race of able young draughtsmen, but there seems to be a striving after eccentric features without much regard to the comfort of the occupants. One sees a house on the top of a hill with bedroom windows the whole width of the room, and therefore so large that there is no warmth, while the lower floor of living rooms has windows so small there is no light. Young architects might also be instructed in the planning of sites for country houses and cottages, and even in the laying out of gardens. In conjunction with these courses the student would also be taught the relative cost of the different methods of planning and the increased cost due to various methods of exterior architectural treatment. Perhaps it would not be too much to expect that the building owner should be consulted as to his requirements.

One of the first matters with which an architect will have to deal when he confers with his employer is the question of cost. For this purpose he must be trained to measure and estimate and learn the value of different materials, for many architects have to settle up builders' accounts. Then there is the proper specifying of the materials and the works to be carried out. This is a matter in which very great foresight is required, besides a thorough knowledge of every kind of detail. Yet only a single lecture is devoted to this first essential in the Architectural Association school.

But assuming that the student has picked up sufficient knowledge to make a plan and write a specification, the next question is, What does he know about his duties to the building owner, the clerk of works, the quantity surveyor, and in connection with the employment of manufacturers of special materials? Upon a proper knowledge of these depends whether the building owner will be protected from troubles from various quarters and possibly from litigation. Disputes arise generally from (1) misdescription in the specification and discrepancies in the drawings; (2) under-estimating the cost of the works; (3) unauthorised alterations and additions; (4) failure to supply the builder with drawings and instructions when they are wanted; (5) insufficient supervision; (6) the employment of specialists; (7) the supply of materials to the builder by the building owner; and (8) the settlement of accounts. Other disputes sometimes arise from the indecision of the architect, his failure to act according to the conditions of contract, and from many other causes. It is essential that the architect should act in accordance with the conditions of contract, which regulate the rights of the builder and the building owner and his own duties while employed as architect under the contract. The standard form of conditions of contract approved by the Royal Institute of British Architects contains many difficult puzzles of interpretation. For example, the provision that arbitration is not to take place until after the completion of the works is a very undesirable one, for it leaves the owner at the mercy of any action of law the builder likes to bring during the progress of the works. Further, it would appear that in one clause of these conditions the works are to be completed to the reasonable satisfaction of the architect, while other clauses are ambiguously worded, if reasonable satisfaction is intended by the conditions generally. Inasmuch as the young architect may have to act as arbitrator as well as architect, he should be taught the principal duties of an arbitrator, and it should be pointed out to him how essential it is to act with the most scrupulous fairness between the builder and the building owner during the course of the works in view of that quasi-judicial position. If he inadvertently acts otherwise he may be disqualified from acting as arbitrator. One elementary rule is that the young arbitrator should at a very early stage either ask for a cheque on account or for a joint undertaking to take up his award and pay his fees.

The Institute might with great advantage when appointing an arbitrator select one specially conversant with the kind of matter in dispute. This would be facilitated if builders and building owners when applying for an arbitrator were to fill in a form with particulars of the dispute, and also give the name of the parties and the architect so that the arbitrator may be an impartial one. The arbitration should be conducted in the same manner, and decisions given on the same principles, as in the High Court. In the High Court if a party wins he is entitled to his costs, unless the judge in the exercise of a proper discretion deprives him of them. In matters like the proper awarding of costs it is by far the better and safer plan for architects to take legal advice and act upon it.

The employment of merchant specialists gives rise to constant litigation, difficulties and disputes occurring from many causes. The chief cause is a defective contract; but another, and almost equally important one, is the unbusinesslike and uncertain arrangements made with them by the architect, and the delays and hindrances caused to contractors in consequence. Another cause is the not uncommon practice of corporations and other employers of purchasing some of the materials themselves, with the result that they are delivered at the wrong time. The duty of architects is to advise in such matters.

The instruction in the school should be divided into two parts—the business side and the art side. No student should be allowed to join the art side unless he joined the other; the two branches of study should go on together, and no student should be qualified as an architect unless he had passed an examination in the business side. There is even then a danger that the student may never have the opportunity which he had as a pupil of learning at first hand how to uphold the honour of his profession.

At the conclusion of his paper Mr. Hudson suggested that an architectural standards committee should be formed in order to put the specifications for the ordinary requirements of everyday building practice into standard form, and to keep these forms up-to-date by periodical meetings. Later they might standardise details of various work in respect of which the considerations of art do not enter. This committee would be supported by sub-committees consisting of representatives of local and government departments, and technical societies, contractors, merchants and surveyors, as well as architects.

*(To be concluded.)*

# MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

## VI.—THE REFRIGERATING MACHINE (*continued*).

We are now acquainted with the physical characteristics of the three refrigerants, and, as they vary considerably, it will be seen that there must be certain divergences in design, according to which of the three is adopted. The two points which most materially affect the proportions of the machine are the great difference in working pressures, already observed, and the corresponding variation in the capacity of the compressor, which is yet to be investigated. An exact knowledge of the latter involves going slightly further into the theory of the machine than we have done hitherto, but it is necessary in order to appreciate the relative values of the three systems that the investigation should be given in full.

It must be clearly understood, first of all, that the gross amount of cooling done is directly proportional to two factors: the weight of refrigerant passing through the evaporator, and its latent heat of vaporisation. Each pound which is evaporated absorbs a certain number of B.T.U.'s, which is exactly equal to the latent heat (measured, of course, in B.T.U.'s) of the particular refrigerant employed, and a machine pumping 10 lb. per minute of a given gas will do ten times as much work as one pumping only 1 lb. Similarly, if the latent heat of one gas is four times that of another, a machine using the first gas will do four times as much work as one using the second and pumping the same weight.

Hence the work done by different machines using the same gas, whose weight per cubic foot remains constant, will be exactly proportional to the "displacement," or capacity of the compressor (measured by the cubic feet of gas it will pump in one minute), and, the displacement being known, it is very simple to calculate the refrigerating output of the machine. We must know, first, the compressor displacement in cubic feet per minute; second, the weight of one cubic foot of the gas in pounds at the temperature of the evaporator, and, third, its latent heat at the same temperature in B.T.U.'s. The weight pumped per minute will then be equal to the displacement multiplied by the weight per cubic foot, and this quantity multiplied by the latent heat gives the B.T.U.'s extracted per minute. To find the B.T.U.'s absorbed per hour we must multiply by 60.

Putting it down in symbols, let

D = Displacement in cubic feet per minute.

W = Weight in pounds per cubic foot at, say, 14° Fahr.

L = Latent heat in B.T.U.'s at 14° Fahr.

(The refrigerant would evaporate at about this temperature—14°—when cooling an ordinary store.)

Then B.T.U.'s absorbed per hour by the machine—

$$= D \times W \times L \times 60.$$

The same number of units, plus those developed during compression, are of course discharged into the condensing water

There is yet another point to be considered in this calculation. The figure obtained by the above formula will represent the gross heat extracted by the evaporating gas, but the net heat will be rather less, as the liquid enters the evaporator from the condenser at a relatively high temperature, and, before useful work is done, must be cooled down to the temperature of evaporation. The B.T.U.'s necessary for this must, of course, be subtracted from the gross number of B.T.U.'s absorbed, and the capacity of the machine is, therefore, proportionately reduced.

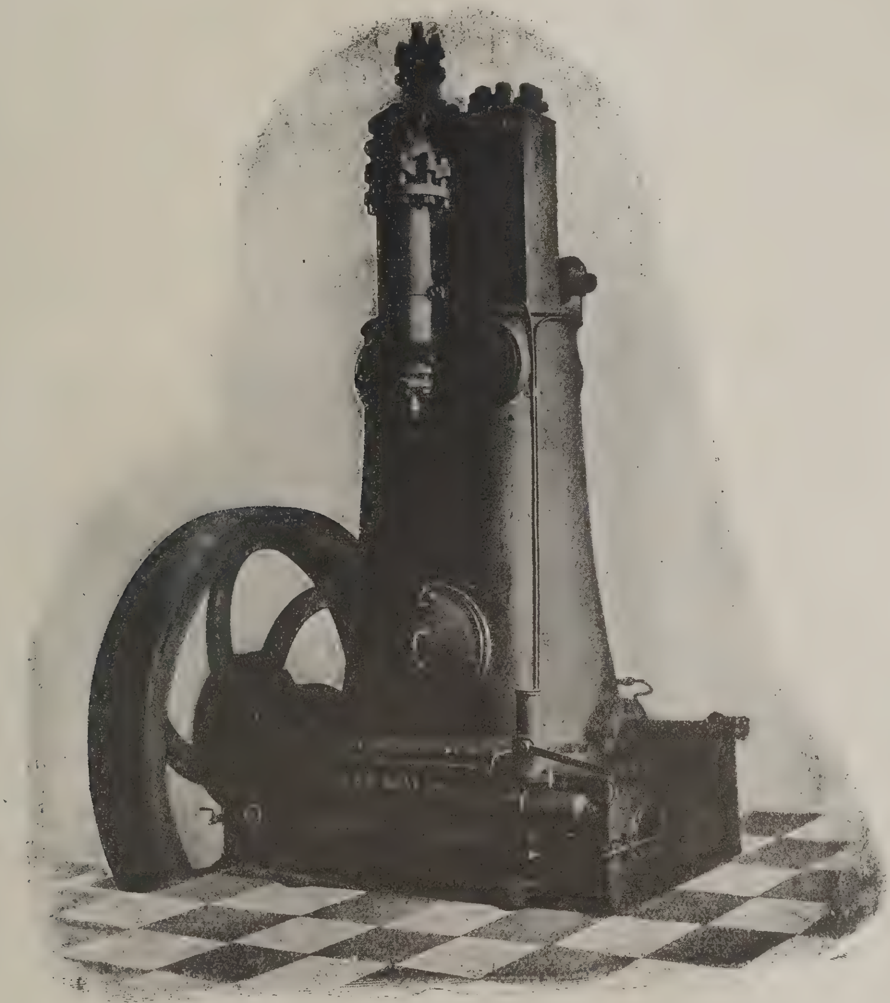


Fig. 18.

The exact amount of the reduction depends on two quantities, the specific heat of the liquid refrigerant and the weight passing through in a stated time. Specific heat, it will be remembered, is the number of B.T.U.'s necessary to cool 1 lb. of substance by 1° Fahr., and is generally less than unity. Hence the B.T.U.'s wasted per minute in this process will be equal to the weight of refrigerant pumped in that time multiplied by its average specific heat and by the fall of temperature past the expansion valve. The amount of the latter, if the evaporating temperature is as before, 14° Fahr., and if the gas leaves the condenser at 68° Fahr., will be 54 degrees.

Resorting once more to symbols, let

$S$=Average specific heat of the liquid refrigerant in B.T.U.'s.

$D \times W$=Weight pumped per minute in pounds.

$T$=Fall in temperature in Fahr. degrees past the expansion valve.

We have then:—

B.T.U.'s wasted per minute $= D \times W \times S \times T$.

B.T.U.'s wasted per hour $= D \times W \times S \times T \times 60$.

Net B.T.U.'s extracted per hour=gross less wastage.

$$= (D \times W \times L \times 60) - (D \times W \times S \times T \times 60)$$

$$= D \times W \times 60\,(L - S \times T).$$

If a further deduction of 10 to 15 per cent. from the net B.T.U.'s is made to allow for slip in the compressor and minor losses, we have finally the actual B.T.U.'s per hour which we may reasonably expect the machine to absorb.

If this calculation has fulfilled its object, it will be apparent that the displacement or capacity of the compressor, for a given output of refrigeration, is different with each different refrigerant. It has been proved, in fact, to depend on three variables—the weight of the refrigerant per cubic foot as a gas, its latent heat of vaporisation, and its specific heat as a liquid. Now, from our formula it is obvious that the larger the values of the two first and the smaller that of the third, the greater will be the number of B.T.U.'s which can be extracted by a given displacement. Hence a compressor pumping a stated number of cubic feet per minute will do the maximum amount of refrigeration, when working with a refrigerant, which is dense as a gas and has a high latent heat, and whose specific heat as a liquid is low; or expressing it in yet another form, a refrigerant possessing the ideal qualities just enumerated will require the minimum displacement in the compressor for a given output.

This fundamental law is of great importance, and it has been reiterated in its various forms in order to make it thoroughly clear, as on it the whole design of the refrigerating machine depends. Hence, before we can compare the compressor capacities needed with the different refrigerants, which is our present object, we must be well acquainted numerically with the three physical constants of each (*i.e.*, latent heat, specific heat and density). It is impossible, of course, to assign definite values to these, as, more especially in the case of the density, they vary to such an extent with the temperature, but, as the result of numerous experiments, standard tables are now available by means of which, for any given temperature, the constants are easily read off. For the sake of comparison their values at an evaporating temperature of 14° Fahr. are appended below. The specific heat given is the average value between 14° and 68° Fahr.

| | Density. Lbs. per Cubic Foot. | Latent Heat. B.T.U.'s. | Specific Heat. B.T.U.'s. |
|---|---|---|---|
| Carbon dioxide ... | 4.535 | 115.70 | 1.02 |
| Ammonia ... ... | 0.147 | 575.40 | 1.02 |
| Sulphur dioxide ... | 0.190 | 168.73 | 0.36 |

It will be seen from this table that the highest latent heat is possessed by ammonia; the greatest density by carbon dioxide; and that sulphur dioxide has the lowest specific heat as a liquid. Hence no one gas is superior in all the qualities which make for the minimum compressor displacement, and it remains to be seen which most nearly approaches the ideal. This is easily done by substituting in the formula obtained above and assuming a refrigerating duty of, say, 100,000 B.T.U.'s per hour. When the calculations have been carried out for each refrigerant, it will be found that to obtain this output the respective theoretical displacements in cubic feet per minute are as follows:—

| | Displacement. |
|---|---|
| Carbon dioxide ... ... ... ... | 6.09 |
| Ammonia ... ... ... ... | 21.80 |
| Sulphur dioxide ... ... ... | 58.82 |

(Assumed evaporating temperature =14° Fahr.; condensing temperature =68° Fahr.)

The compressor in $CO_2$ machines is therefore of smaller capacity for a given duty than in either of the others. This is due to the highly compressed state of the gas, which renders it relatively very dense, as shown in the table already given. The density is in fact so great that it more than compensates for the higher latent heat of ammonia and the lower specific heat of sulphur dioxide. The compactness of the $CO_2$ machine does not, however, extend beyond the compressing cylinder itself, and even then is neutralised to a certain extent by the great thickness of metal, which is necessary to stand the enormous working pressure. The dimensions of both the evaporator and condenser for plants of the same output remain constant, as the heat transfer in each is the same, no matter what the nature of the refrigerant. The working parts of the compressor must also be of equal strength and amplitude, irrespective of the refrigerant, as the total load (which is proportional to pressure multiplied by capacity) is always the same. The cylinder, in fact, is the only part of the machine affected, and, as this is relatively a small item, the total bulk is very little changed.

It is clear then that the compressor capacity and the working pressure are both dependent on the nature of the refrigerant. Now the compressor must be driven, and for this purpose suitable motive power has to be provided. The question at once arises, Is this always the same for a given output, or does it, like the pressure and capacity, depend on the refrigerant? At first sight it might be thought that the answer to the last part of the question is in the affirmative, and that $CO_2$ machines, owing to their high pressure, would absorb a great deal more power than the others. But actually this is not so. The power absorbed theoretically by all vapour compression machines giving the same output is exactly the same, and it is solely due to the difference between practice and theory that there is any variation at all. Theory demands that the machine, for maximum efficiency, should carry out a round of operations, which is known as the "Carnot cycle reversed," and any divergence from this cycle naturally involves a certain loss. For practical purposes, however, it is convenient that there should be such a divergence, and the consequent loss we have already measured. It is equal to the heat wasted in cooling the liquid from the condensing to the evaporating temperature just after it has passed the expansion valve, and depends, as we have seen, on the specific heat of the liquid refrigerant. The loss is greatest in proportion for machines using carbon dioxide, and is about equal for those using sulphur dioxide or ammonia. Hence the first named machine takes rather more power than either of the other two, and ammonia or $SO_2$ machines may be taken as of about equal efficiency as far as power consumed is concerned.

To conclude the study of this type of machine a compact $CO_2$ plant, by Messrs. J. & E. Hall, Ltd., is illustrated in fig. 18. The evaporator, as explained when dealing with double pipe condensers, is placed inside the condenser, and the condensing coils lie between the outside of the evaporator and the inside of the outer cast-iron tank. The latter is utilised as a support for the compressor, which is seen in front, and the small size of the cylinder will at once be noticed.

We have now considered the essential points of the vapour compression system and of the three principal refrigerants by which it can be actuated. The system has been discussed in some detail, as it is by far the most important of the four into which refrigerating machines are divided. Of these three remain, and they are named, it will be remembered, as follows:—

1. Water evaporation.
2. Cold air expansion.
3. Ammonia absorption.

*Ammonia Absorption Machines.*

The cycle on which absorption plants act is rather more complicated than that followed in vapour compression. Essentially it is the same, inasmuch as heat is absorbed into the system by the evaporation of the refrigerant (always ammonia in these machines), and again dissipated by its condensation But, super-imposed on these main effects, we have a number of smaller heat transferences, and for this reason the laws governing the action of the plant are not so simple as those we have already found for vapour compression.

Primarily the system depends, as before, on the latent heat of vaporisation of the refrigerant, and the action of the evaporator is still exactly the same. That is to say, the refrigerant is vaporised under the influence of reduced pressure, and, in doing so, takes the latent heat necessary for the operation from its surroundings. These, as in vapour compression plants, may be either brine tanks or the cold stores themselves, and this part of the system is in no way different to what we have already become acquainted with.

(*To be continued.*)

## ILLUSTRATIONS.

### CATHEDRAL SERIES, LLANDAFF.—THE SANCTUARY.

OUR series of views of Llandaff Cathedral is now drawing to a close, and will be completed next week. The description of Llandaff by Mr. S. BOWEN WILLIAMS was concluded in our issue of March 11.

### RUST EN VREDE, MUIZENBERG, CAPE COLONY.

THIS house was built a short time since at Muizenberg, on the sea coast, a few miles from Capetown, for Mr. ABE BAILEY, the architects being H. BAKER & F. MASEY, FF.R.I.B.A.

The materials are of the simplest description, the walls being of brick plastered and whitewashed, and, with a few exceptions, the whitewash is carried throughout the whole of the interior of the house. The choice of materials and their treatment are influenced by the fact that the building is placed very close to the sea, and has to withstand the deteriorating effects of the salt spray; the wood is, therefore, teak or jarrah throughout, and the metal work generally is executed in bronze. The dining-hall is lined with teak panelling, whilst a decorative result is obtained in the hall by using slabs of Greek Cippolino marble. In designing the building the architects have followed the style of the old Dutch Colonial houses, which is well adapted to the particular requirements of the country, and the rooms are largely furnished with beautiful specimens of old Cape-made furniture. The view from the loggia is remarkably beautiful, embracing a panorama of the whole of False Bay, from the Naval Station at Simonstown on the one hand to the mountains beyond the Hex River Valley on the other.

## THE LATE MR. HERBERT RAILTON.

WE regret to announce that Mr. Herbert Railton, the well-known black-and-white artist, died during Monday night in St. Mary's Hospital, Paddington, to which he was removed on the previous day suffering from an attack of double pneumonia. Mr. Railton, who was in his fifty-third year, was a native of Pleasington, Lancashire. The first drawing prepared for publication by Herbert Railton was published in *The Architect*, and since that time he has held a foremost place in the sphere of book illustration. His work is admirable in respect of textures and fascinating in its colour, although there is sometimes a tendency to unreality in his treatment of values.

THE Bishop of Crediton, speaking at the annual meeting of the Exeter Diocesan Church Building Society, said the Society had again been regretfully obliged to refuse grants owing to unsatisfactory plans, and they desired to call the attention of the clergy and others to the great importance of employing a really competent architect for church building and restoration, and also that the architect should be a Churchman and one well acquainted with the Church's worship, &c.

# THE MEDIÆVAL HOUSE.*

*(Concluded from last week.)*

ON one of the matter-of-fact pages of Bridges's " History of Northamptonshire " there is a brief but interesting ketch of the fate of a mediæval house of wood. In the reign of Stephen, some seventy years after the Conquest, the lordship f Clopton belonged to a knight of Norman descent, William e Grauntkort, usually called, on account of the difficulty which the common people found in pronouncing his name, William de Clopton. Being of somewhat the same profane urn of mind as Gamelyn, he had converted more than a third part of the churchyard to some secular use of his own, and e had cut down a noble grove of ash-trees which grew in it in rder to use the timber in building his mansion-house. Soon fterwards he got married, and as his bride lived near Newark he went thither, as he would have done in the present ay, for the wedding. Honeymoons were not then the ashion, so the bride and bridegroom, with their retinue, set ff to ride to the bridegroom's house at Clopton, where a reat feast was ordered to be ready. They travelled southwards towards their home, much as in later times, only, in his case, with a great deal more comfort and splendour, Katherine and Petruchio travelled towards Petruchio's ouse. After passing through the ancient town of Stamford hey gained the high land near Wittering, where still stands he church which they must have passed. But however much William may have wished to show this interesting building o his bride, Ivetta, their attention was attracted by a distant onflagration, almost due south, exactly in the direction for which they were making. Their forebodings were but too well justified. The blaze came from their own house, the ouse so profanely built of the sacred ash-trees from the hurchyard. The whole mansion was consumed, and with it he wedding feast and all the preparations for welcoming the ride.

The ancient chronicler quoted by Bridges regarded this alamity as a direct judgment for William's profane conuct. No further particulars are given, and we are left to arren conjectures as to when and where the wedding feast was eventually held.

This incident, casually included among more important etails, such as the descent of the manor, the alliances of he lords and their relations, and so forth, brings home to s vividly the usual fate of such early houses, and enables us o see more clearly why none of them have survived for our nvestigation.

Although in the county of Northampton, the home of a most beautiful building stone, Clopton stands on clay, and William de Grauntkort probably found it much easier to cut own the ash trees than to fetch stone from Weldon, some welve miles away, with a river to cross. However, he paid early for his choice.

It was the wooden kitchens which led to this digression bout William de Grauntkort and his lamentable home-comng. But kitchens were not always built of wood; many of hem were very notable buildings of stone. Of early examples here are few, if any at all. But there are several of later mes, all of them independent structures connected to the main building by a corridor. Among the more notable are he kitchen of the monastery at Durham, that of the abbey at lastonbury, that of the house at Stanton Harcourt, and that t Cowdray House. Most of these had several huge fireplaces n the walls, all of them had fine louvres, or ventilating turets, carried on stone groining ribs. Stanton Harcourt apears to have had an open fire on the floor, and its louvre is f wood; but the principle is the same in all cases—plenty of re for cooking and plenty of ventilation for the smoke and mell. These examples were all attached to large establishments; in the case of smaller houses the kitchen was one mong the rooms covered by the general roof. Haddon ffords a good example of this kind, although it can hardly e considered a small house; circumstances, however, did not llow of a detached kitchen in this case.

But now, having got a more or less vague idea of the size, he accommodation and the appearance of a mediæval house uilt of stone, the interesting question arises, How did it ook inside?

The only rooms which need detain us in this connection re the hall and the solar. The kitchen, for instance, would e clothed in its own dark livery of soot; the pantry, the butery, the spence, and other inferior rooms would have bare alls or embellishments of a purely utilitarian character. But the family rooms received a certain amount of decoration, according to the wealth and taste of their occupants. The hall was usually a one-storey structure with lofty walls and an open-timber roof upon which the carpenters had spent their trained skill. It was lighted by windows upon which the masons had spent theirs. The mere elements of its construction, therefore, made it as handsome as a village church. But among the rich its walls were adorned in handsome fashion with beautiful hangings, some being of the most costly kind. Armour and trophies of the chase and of war hung here and there, and at night cast flickering shadows from the light of the fire and of great torches. The smoke eddied about in the upper regions, and finally made its escape through the unglazed windows or the louvre in the roof. Very few windows were glazed, but they were closed by means of wooden shutters, which were painted bright with the glowing colours of heraldry. Some few houses had their windows glazed in part, and Henry III. gave orders for the glazing of some of his with painted glass representing well-known stories, his favourite subject being the parable of Dives and Lazarus.

The walls were very frequently plastered; and plastering was much more common in houses and churches than the restorers of twenty and thirty years ago seem to have been aware of. Even now some enthusiastic parsons think that the first step towards restoring a church is to hack off the plaster, little realising how the original builders would have stood aghast at the effect. The plaster was not laid on thickly and brought to a beautiful even surface; on the contrary, it was quite thin, and showed the wavy surface of the wall. On the plaster were frequently drawn thin lines of colour, as though to represent the joints of stones. In the prior's chamber at Abingdon Abbey, now a dark hay-loft, the enterprising inquirer can still see the original plastering of six and a half centuries ago, marked out with just such lines.

Panelling was another method of covering the walls, or, as it was then called, " seeling." Orders were given by the king in one case to " seel " both the walls and the roof of one of his halls for a certain number of bays, in order to lessen the draughts as he sat on the daïs. Whether the panelling was framed together or merely consisted of boards it is difficult to say; but the examples of thirteenth century panelling are few, if any. The " seeling "—whichever form it took—was painted green and powdered with gold stars.

There can be no doubt that Henry III., in the thirteenth century, strove to make his houses more comfortable than he found them. Even in those hardy times it was felt desirable to do something to lessen the draughts, to circumvent the weather, and to warm and decorate the rooms. The king possessed innumerable houses, large and small, in the southern and midland counties; and the orders given in respect of them are of great interest. Chimneys were built to many rooms to warm the inner air; porches and corridors were built to check the incoming of the outer air. At Everswell a porch was made before the door of the queen's chamber; at Oxford a fair and decent porch was ordered to the south door of the hall, another at Clarendon, and again at Marlborough and Kennington. At Westminster, in the year 1245, Edward Fitz-Otho was commanded to build a porch such as might become so great a palace so that the king might dismount from his palfrey in it at a handsome front. At Woodstock an aisle was made between the queen's chapel and her chamber so that she might go to and return from that chapel with a dry foot.

In 1238 orders were given to glaze a window of one of the rooms at Westminster so that that chamber might not be so windy as it used to be. In another case two windows were inserted with white glass casements to open and shut; and at Northampton a glass window, which might be closed and opened, was made in the hall opposite the king's daïs, and painted with the figures of Lazarus and Dives.

There are several orders for louvres—one for the great hall at Woodstock in 1244; another, four years later, over a hearth of freestone, high and good, in the chamber above the wine cellar of the same house; and yet another in the hall at Winchester, to carry off the smoke.

There are also many orders for decorating the various rooms, one of the most frequent being for the application of whitewash. The tower of Corfe Castle was ordered to be whitewashed externally; the new tower at Winchester to be whitewashed inside and out; the great hall at Clarendon, the tower at Guildford, the hall of the same house, within and without, were to be treated in a similar fashion. The queen's chamber at London was to be thoroughly whitened internally and painted with roses; a chamber, chapel, and wardrobe at Nottingham were to be whitewashed and pointed lineally—

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* A paper read before the Architectural Association on March 4 y Mr. J. Alfred Gotch, F.R.I.B.A.

like the prior's room at Abingdon. The favourite method of internal decoration, however, was to paint the walls green, spotted or scintillated with gold. Occasionally pillars were to be painted of a marble colour—so the decorators of twenty years ago had an august precedent for what we consider their enormities. Figure subjects were frequently painted on the walls or on the chimney; the "history" of a saint or a town, the Wheel of Fortune, the Four Evangelists, or, once more, Dives and Lazarus. On the chimney of the queen's chamber at Westminster was depicted a figure of Winter, which, as well by its sad countenance as by other miserable distortions of the body, might be deservedly likened to winter itself. On the wall at Winchester a map of the world was painted.

What would we not give to find some of these things now?

These orders, given in the ordinary course, just as one of us might order a room to be papered, convey to our imaginations a most valuable picture of the inside of a mediæval house. It is true that the owner was the king, and that, like Dogberry, he liked to have everything handsome about him. It is also true that the idea is conveyed of a multiplicity of rooms. But it must be remembered that the houses belonged to the king, who not only lived in considerable state himself, but was attended by a considerable retinue. If we translate the terms of a king into those of a knight, we come back to the more simple accommodation shadowed forth by Chaucer in his tale of Gamelyn. But some of the splendour which surrounded the monarch no doubt found its way in a chastened form into the houses of his subjects; and Gamelyn, as he stood bound in the hall, may have beguiled the weary hours with studying a picture on the wall, the history of a saint, the Four Evangelists, or even the figures of Lazarus and Dives, and he may have idly wondered how far he resembled the one and his brother the other.

Mr. GERALD HORSLEY, in proposing a vote of thanks to the lecturer, said the part of the paper which interested him very much was Mr. Gotch's description of the decoration which took place in a mediæval house—the paintings on the walls and so forth. It was a matter of great regret, he thought, that there were so few instances left in England of early painting in houses. He had been interested to hear that in Abingdon Abbey there existed the remains of that wonderful decoration in painting on a wall in imitation of the joints of stonework, and he believed it must be the last example remaining of what was the only form of decoration at that time. He remembered a similar and very beautiful one in the castle at Coucy, in France. The reference the lecturer made to the exterior plastering and whitewashing of whole buildings was very interesting. There were some Saxon towers still remaining in England which had Saxon plaster still upon them. He thought they would be pleased if Mr. Gotch could tell them why they were in the habit of doing all that exterior plastering. They knew the people were fond of colour, and it might have been with that idea that they whitewashed their buildings, though perhaps they resorted to it because plaster and whitewash came cheaper than working the rough stone.

Mr. G. L. ELKINGTON seconded the vote of thanks and said the evening's lecture would be remembered for the delightful way in which Mr. Gotch had opened up to them a page from the greatest or the earliest real English poet, and at the same time he had shown them the exteriors and interiors of some of the most delightful examples of the mediæval houses. He had been rather hopeful, he said, that Mr. Gotch would take them a little further through the interior of some of those houses. The question of furniture would have interested them as architects, and even the bedstead had a history of its own. Another point was in relation to chimneys. When they remembered that the house was probably intended as shelter or defence rather than as a place of comfort, they could understand that the inmates were prepared to bear with a good deal of discomfort. Was the hooded chimney earlier than the recessed? It seemed to him that the hooded type should be the earliest, and yet the illustrations they had seen suggested the reverse. On the question of wall hangings, he did not know whether such forms of decoration were to be found in some of the houses Mr. Gotch described, but he believed they were valued and borrowed and lent to different people.

Mr. BRITTAN suggested that the raised solar was perhaps planned as a preventative against the damp, which must have been common in mediæval houses.

Mr. F. DARE CLAPHAM said the lecturer had not told him if any attention was paid to aspect in planning mediæval houses. They were crude and rough, but in one respect we could take a lesson from them. In those old houses they seem to have paid great attention to their kitchens, and there was plenty of space and ventilation.

The PRESIDENT said he thought they appreciated those old houses more now than if they had to live in them under the same conditions, for they must have been extremely uncomfortable.

The vote was passed by acclamation.

Mr. GOTCH, in his reply, said as to chimneys, be believed the earliest examples were recessed. In later years tunnels were used with them, and still later hoods were introduced. In conclusion, he said the whole history of mediæval domestic architecture was the development of one room into many. It was a long process and only affected the upper members of the family, but as with the motives of all changes in domestic architecture its aim was towards providing greater comfort to the inmates.

## THE LATE SIR THOMAS DREW.

BY the death of Sir THOMAS DREW on Sunday last many members of the architectural profession in Great Britain, as well as in Ireland, have lost a valued friend. His frequent participation in the annual excursions and other proceedings of the Architectural Association gave many of us the opportunity of a close acquaintance with one of the most genial personalities amongst the architects of our time. The high position that Sir THOMAS DREW attained as an artist and architect is well expressed in the following obituary notice, for which we are indebted to the *Irish Times*:—

By the death of Sir Thomas Drew, Dublin has lost a distinguished citizen and the Irish profession of architects one of their foremost members. An Ulsterman by birth fifty years ago Sir Thomas took offices in Clare Street, and during that long period never changed his business address No person who had seen him lately would have thought by his appearance that he had passed the allotted span of three score years and ten. He was born in Belfast on September 18 1838, his father being a clergyman of the Irish Church, the Rev. Thomas Drew, D.D., Rector of Loughin Island, Co Down, and a Precentor of the Down Cathedral. Having received his early education in Belfast, he was apprenticed to the late Sir Charles Lanyon, C.E., and shortly after being admitted to the architects' profession established himself in this city. From the beginning of his professional career he made the subject of ecclesiastical architecture one of specia study, and was at a young age appointed as consulting architect to the three principal cathedrals in Ireland—St Patrick's, Christ Church, and the Armagh Cathedral—which positions he retained to the last. His principal original work as an ecclesiastical architect was the designing of the Belfast Cathedral, whch is a noble conception, and worthy of hi high reputation. In Ireland of late years most of the new churches that have been erected belong to the Roman Catholi denomination, and naturally were entrusted to other hands The church of St. Kevin, on the South Circular Road, on of the few Protestant churches built in Dublin of late years was designed and erected by Sir Thomas Drew. A complet list of his works in the city would be a very long one, bu some few may be mentioned—viz., the Ulster Bank, in College Green; the Belfast Bank in the same vicinity, and th much-admired head offices of the Hibernian Banking Company. Sir Thomas designed that fine building, the Northern Bank, in Grafton Street. In Trinity College the addition to the library and the present fine reading room were alteration which were carried out from his plans, while exactly opposit to the library is the handsome Graduates' Memorial which h designed. In 1901 Sir Thomas Drew designed the beautifu spiral staircase leading to the organ chamber in St. Patrick' Cathedral. The construction of this chamber cost 11,000*l* which was defrayed by Lord Iveagh. As is well known, th restoration of Christ Church Cathedral was entrusted to Mr Street, who, however, employed Sir Thomas, then Mr. Drew to assist him in carrying out this great work, which he di in the most admirable manner, sparing neither time no labour.

During his long life Sir Thomas Drew filled the highes positions in many of the learned and artistic societies in th city. For two years he was President of the Royal Institut of Architects of Ireland (1895-97), and he has also bee President of the Royal Society of Antiquaries, a society i which he took a deep interest, and at whose meetings he constantly read valuable papers. As a writer Sir Thomas po sessed a lucid style, which always made his contribution acceptable. Of the history of Christ Church Cathedral h had mastered every detail, and for many years on each St. Stephen's Day it was his custom to conduct a party round the cathedral, to whom he explained each object of interest. These lectures, as they may be styled, were largely attended, but they have never been published, although, without doubt, most of their substance is to be found in the various articles written by Sir Thomas Drew on this subject. He has shown by comparison that the ground plan of the Danish Christ Church of Waterford is a genuine replica of Dublin Cathedral. A subject which Sir Thomas Drew was never tired of discussing was the theory, originally started by a ady, that all the Christian cathedrals were copies of designs by early Comacine builders, whose secret marks he has discovered on many of the stones in both Christ Church and St. Patrick's. Having succeeded Sir Thomas Farrell as President of the Royal Hibernian Academy, Sir Thomas Drew received the honour of Knighthood from Earl Cadogan in 1900, and five years later the University of Dublin conferred on him the degree of LL.D., honoris causa. His many professional distinctions include the Fellowship of the Royal Institute of British Architects and the honorary membership of the Royal Society of Scottish Architects. As a cathedral architect he was considered one of the highest authorities in the kingdom, and on several occasions his services have been requisitioned in connection with work to be done in English cathedrals. In knowledge of the profession to which he was so long attached he was second to none, and as an arbitrator on the merits of designs he was much valued. Last year he was appointed a member of the International Exhibitions Royal Commission, and he was also a Governor of the National Gallery. It was only the other day that Sir Thomas Drew was chosen as Professor of Architecture in the National University. Sir Thomas Drew was a member of the Masonic body, and a man of the most charitable disposition. In all ists of subscriptions for the furtherance of humanitarian objects his name was invariably to be found, and his wide circle of friends included persons of every shade of politics, while his religious views were of the most tolerant description. In 1871 Sir Thomas Drew married the daughter of another distinguished architect, Mr. William Murray, formerly of he Board of Works, and for many years resided at Monksown. A scholarly gentleman and a supporter of art, his place will be hard to fill on many Boards. Sir Thomas Drew possessed probably the finest collections of miniatures in Ireland, some of which were of much value.

## JAPANESE DECORATIVE ART.

IN a lecture delivered on the 10th inst. at Carpenters' Hall before a crowded audience, Mr. W. Harding Smith, hon. librarian of the Japan Society, gave a general outline of the history of Japanese decorative art. He divided the lecture under four heads, viz., pictorial art, sculpture, acquer, and metal work. Japanese decorative art was not, he explained, the highly conventionalised and restricted variety which passed under that name in European art, but t was art in its fullest sense, an art intended to beautify. Mr. Laurence Binyon, in his "Painting in the Far East," had thus expressed the fact:—"In Europe we talk of decorative art as different in kind from pictorial art, but in Japan the division is hardly apparent"; and, again, "such an art never loses sight of the condition of a picture as a decoration on a flat wall."

Without much exaggeration it can be said that the Japanese are a nation of artists. The flexibility and suppleness of hand acquired by them through many generations n writing the complicated forms of their picturesque script with the brush must have been a considerable factor in their art training, and has educated their eyes to appreciate beauty f form and arrangement. To understand the pictorial haracter of the Chinese ideographs which they use, it is only necessary to look at the more ancient forms, dating about 50 to 300 B.C., to see that at some remote period they were really pictures of the objects they represent, although nearly all trace of the original forms has disappeared through abbreviation.

The earliest mention of painting in Japanese history occurs in an ancient chronicle of the year 463 A.D., when it was recorded that skilled artists came over from Korea, and among hem a painter named In-sa-ra-ka. But the commencement f Chinese influence is usually ascribed to the reign of the Empress Suiko (565-567), when Buddhism brought with it Chinese literature and fashions. In the quick process of assimilation the Japanese developed an art of their own, adding a lightness of touch, an originality and boldness of esign, and a harmony which is seldom found in the older art. Two of the reasons why Japanese painting lends itself so well to decorative art of all kinds are its simplicity of purpose and its directness of method. Instead of the elaboration of the Western gallery picture it is content to depict one idea, one theme. In many cases backgrounds are ignored. The absence of direct light and shade and also of cast shadows is another element in favour of decoration.

In temples the walls, sliding panels, doors, and sometimes the ceilings were painted with designs *in situ*. In private houses the chief places for decoration were the sliding partitions of the room. But the principal form of Japanese pictures was the "kakemono," or hanging picture, that could be rolled up and put away when not in use. These pictures, painted either on paper or silk, and usually set in a mount of silk brocade of two colours, form a very pleasing combination. They were always hung in a special recess, and were changed from time to time at different seasons and on special occasions.

The earliest known painting is in the temple Horiuji at Nara; it is of the eighth century and is a representation in distemper of Buddha in Chinese style. But in the next century a more national school was founded, until last century there arose a succession of styles which were passed on through many generations. In the eighteenth century the Shijo or naturalistic, and the Popular schools had their origin, the former showing signs of Western influence. The latter is better known to us in the form of colour prints, which form of art was brought to perfection about 1760 by Harunobu (and for the first time a full palette of colour was used). His prints, rather effeminate in style, were the first to combine elegance of line, agreeable composition, and harmonious colour. From his time to the middle of the nineteenth century a great host of colour print designers flourished. In considering Japanese painting it must be remembered that while in the West the painting of the undraped human figure is regarded as the highest aim of art, in Japan the human figure as a thing of beauty may be said not to exist. The Buddhist religion with its high spiritual ideals teaches that the body is a vile and unclean thing. The beneficent deities are therefore draped, while those of demoniacal origin are represented as nearly nude. This dislike of the nude may also perhaps be attributed to the custom among the lower classes of exposing their bodies while at work.

The sister art of sculpture finds its highest expression in religious subjects. Wooden figures carved by priests and men of noble birth are often met with. Perhaps the most notable of them are the two Deva kings, guardians of the Todaiji temple at Nara, which are attributed to the eleventh century; they are 26½ feet high. It is, however, in bronze that the most notable monuments are to be found. At Kamakura there is a seated figure dating from 1252, which is 49 feet 7 inches in height. It was built up in sections and soldered together.

Towards the close of the sixteenth century the temples grew to be profusely decorated with sculpture and lacquer work. Their chief characteristics were a great preponderance of roof, and elaborate carved work and corbelling under the eaves; they were also richly decorated with gold and brilliant colours. Some of the gates are magnificent. There is a curious parallel between the sculpture of these temples and that of the mediæval woodwork in some of the choir stalls of European churches and cathedrals where we find angels, demons, monsters and animals of all varieties mingled with birds, flowers and other objects. The same kind of medley, though of a still more profuse character is seen in the Japanese temples where the effect is further heightened by gold and carving coloured. One of the greatest masters of this kind of carving was Hidari Jingoro (or left-handed Jingoro). He worked between 1590 and 1634, and may be said to have founded a school. He was to Japan what Grinling Gibbons was to England at the end of the seventeenth century, a master-craftsman in his kind of work. Many of the temples were decorated by him. Some of his best known work is at Nikko and Kyoto. One great feature of these carvings is the subordination of detail to general effect, thus showing the feeling of the true artist; in this respect he differed somewhat from the general run of Eastern carved work which so often aims at great minuteness of detail. The great feature of most temples was their beautiful environment, the cool green of the trees forming an effective background to the gold and colour of their shrines. This love of nature was largely owing to the influence of the Buddhist religion.

The contrast between the domestic dwelling and the temple was very great; while the latter was gorgeous with carved work, painting and gilding, the private houses were built of plain unpainted wood, generally selected for the beauty of its grain, which was regarded as sufficient ornament. No paint or artificial graining was used, but every advantage was taken of any natural peculiarity in the wood to add a picturesque touch to the room. The Japanese carpenter, who was also the builder, never lost an opportunity of introducing something which was quaint, and yet natural. There was one part of a Japanese room, however, which lent itself to carved work of a more or less elaborate character, and that was the part between the lintel, where the sliding panels run, and the ceiling. This space, from 18 inches to 2 feet wide, was often filled with panels of carved work, forming a ventilating frieze. Sometimes it consisted of open fretwork or diaper patterns; at others, it was carved with various designs, birds, flowers, &c., and sometimes coloured with distemper in the natural colours of the design. Painting was freely employed on the sliding panels, which were of paper stretched on a wooden framework; in the palaces and castles these were often richly gilt and decorated.

In Japan the carpenter stands pre-eminent as the chief constructor of buildings. The saw used is quite unlike our own in shape, and is worked in the reverse way, being drawn towards him; the same with the plane. The drill, which is his substitute for the bradawl and gimlet, he rotates rapidly between the palms of his hands. He very often sits to his work, where our carpenter would stand, and he holds the plank with his feet. The use of lacquer was carried in Japan to heights unknown in any other country. The styles and schools of the different periods vary as much as those of painting, and in fact there are many points of similarity between the two artists. Lacquer is the juice of a tree, which is collected from cuts made in the bark, and then purified. After many long processes, amounting in all to twenty-five or thirty, the article is left many days to harden in a damp cupboard, and after that it is polished. The earliest known specimens are of the ninth century; they appear to have a flat surface decoration sprinkled with gold. Perhaps the golden age of the lacquerer's art may be said to include the latter part of the seventeenth century down to the early nineteenth century. The great feature of Japanese lacquer was the impartiality with which the precious and the baser metals were associated, lead and pewter being often inlaid in gold grounds together with silver and even tin. The lacquerer cared little for the commercial value of the material so long as it suited his scheme of colour.

Mr. Harding Smith concluded his lecture by referring to the decoration of Japanese swords, these being the most interesting branch of native metalwork.

## COMPETITION FOR OLDHAM TOWN HALL EXTENSION.

THE following is the text of the assessor's report on the architectural schemes lettered "A" to "R" submitted by local practitioners:—

Acting on your instructions I have now made a thorough and exhaustive examination of the whole of the drawings sent in for this important public building and herewith have pleasure in laying before you the result of my adjudication. Every scheme has received my most careful study and investigation and as a result of my anxious deliberations, extending over many days, I have no hesitation in awarding the set of drawings marked "O" the honourable position of first place. The author of this design has shown considerable ability in successfully mastering the problem given, viewed either from the points of arrangement, design, or construction, and without displaying any exceptional originality yet taken as a whole this scheme stands out as the best submitted, and in the planning admirably embodies in a compact and convenient form the accommodation as clearly defined in your "Instructions and suggestions to architects," with such elasticity as all such requirements permit. The architectural conception indicates strength and refinement both with the internal as well as the external treatment with ample light and ventilation. The principal façade to Greaves Street, as well as those to Firth Street and Mill Street are all scholarly and dignified, yet simple in character without any excess of ornament and in my opinion will enhance rather than detract from the architectural importance of the present structure. This problem necessitated very careful handling, the difficulty being increased owing to the somewhat rapid fall in the levels of the Greaves Street and Mill Street elevations. Taken as a whole the premier scheme "O" is not an extravagant one, considering the liberal accommodation it provides, but after carefully checking the cubical contents as supplied by its author in his report, I am of opinion that his figures are, if anything, slightly in excess of the actual measurements. Also I certainly considered 10*d.* per foot cube should be the minimum allowance for the moneying out of the main structure (above ground floo
level) and that 1,500*l.* should be provided at least for th
alterations to the existing building. With the addition o
these amendments, however, the author of scheme "O'
will still be able without difficulty to carry out his design i
a satisfactory manner within the stipulated expenditure o
25,000*l.* and strictly in accordance with the particulars give
in your "instructions and suggestions," due care being exe
cised when detailing the work generally.

Respecting my decision as to the awarding of the secon
and third premiums I have experienced considerable diffi
culty in advising you. Although many capable designs car
fully conceived and conscientiously developed have been su
mitted, yet in each certain blemishes and points
weakness (more especially in the planning of util
tarian arrangements generally) are to be found when com
pared with scheme "O." Some also have failed through a
imperfect knowledge of the requirements of the several de
partments, more especially as to their general working an
routine. An elaborate set of drawings lettered "K," com
prising ten sheets of strainers and representing a large ou
lay of time and labour, has been submitted. Unfortunatel
their author has taken upon himself to entirely remove bot
existing Borough Court and the Council Chamber and r
plan the same in the new portion. Such a drastic deviatio
from the "instructions and suggestions" issued for com
petitors' guidance, and in which no such provision is eve
outlined, entirely extinguished their author's chance irr
spective of other defects in the designs, especially in t
planning. I was, therefore, compelled to further disrega
same—I had no alternative.

There are, however, two schemes, lettered "D" an
"H," which I have finally chosen from the remainder aft
a lengthy scrutiny, each of which contains certain merit
its own either in arrangement or design (or both) coupl
with a sincere and earnest effort to faithfully solve t
problem. Although there is but little to choose betwe
them, yet in one or two points I consider the former has t
advantage, and therefore I award "D" second place a
"H" third place.

My adjudication therefore is:—

First design, lettered "O," premium of 50*l.* and I tru
also its author to be appointed architect for the work on t
terms of the conditions specified.

Second design, lettered "D," premium 30*l.*

Third design, lettered "H," premium 20*l.*

I can only affirm should your Corporation accept my awar
(after an inspection and explanation of the designs sent i
and adopt scheme "O" for execution, in my judgme
without doubt they will secure the best design submitted a
one that most fully and adequately embodies their requi
ments as a whole. It is an excellent solution of the proble
and I believe few will be found to dispute its positio
indeed, this competition clearly indicates Oldham has
lack of capable architects to choose from for her importa
undertakings. Remembering the importance of this compe
tion to the architectural profession locally I would respe
fully suggest your Corporation making such arrangements
will permit the whole of the designs being publicly exhibit
(as is frequently ignored) for at least seven consecutive da
This will give every competing architect the opportunity of
personal inspection together with a perusal of my report.
conclusion, I desire to express my sincere thanks to t
several officials of the Corporation, more especially t
borough surveyor, borough treasurer, and the chief co
stable, for the valuable information each most readily ga
me respecting his particular department, and also t
town clerk for the admirable arrangements he made
ensure the absolute privacy and entire immunity from int
ference or distraction which I enjoyed throughout my som
what lengthy examination.

George H. Willoughby.

The premiated designs are those of Messrs. Taylor
Simister, first (50*l.*); Messrs. Winder & Taylor, seco
(30*l.*); and Messrs. Jenkins, Matley & Mills, third (20*l.*

## NORTHERN ARCHITECTURAL ASSOCIATIO

THE annual meeting of the Northern Architectural As
ciation took place on the 9th inst. Mr. G. T. Brow
F.R.I.B.A., of Sunderland, president, presided over a la
attendance. Mr. James Forbes, Middlesbrough, and Mr.
D. James, South Shields, were both elected members.

In connection with the competitions open to students
the Association the assessor's award was read, and it w
found on opening the sealed envelopes that the followi
gentlemen had been successful:—For measured drawings

existing works: Under twenty-one years, G. E. Charlewood; under twenty-five years, W. W. Nimmo. Architectural sketches: Under twenty-one years, G. E. Charlewood; under twenty-five years, W. W. Nimmo. For the best set of testimonies of study required for the Royal Institute final examination, Wilfrid Lawson; and for similar drawings for the intermediate examination, Joseph Hill and S. W. Milburn were bracketed together.

The Glover studentship, which, subject to certain conditions being fulfilled, carries with it the Glover Medal and a prize of ten guineas, was awarded to Joseph Hill.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

On Thursday evening, March 10, after a general meeting, the students of the Society held their annual conversazione. The prize essay of the year, by Mr. Fred Scatchard, on "The Use and Value of Colour in Architecture," was read and discussed. Mr. Scatchard, in his essay, cited many of the best known examples of coloured architecture of past ages as arguments in themselves as to the value of colour, and dwelt upon the varied agencies by which colour was introduced into buildings, whether by the use of naturally coloured materials or by the application of artificial colour in pigment, mosaic, or glass.

Speaking of modern conditions, he exampled the use of terra-cotta in its many forms as that of an impervious, washable material, capable as far as possible of resisting the ravages of the smoke demon, and, so far, adapted to use in manufacturing cities, a point round which the subsequent discussion revolved; opinion leaning towards the adoption of terra-cotta in preference to the perpetual gloom to which the stone building would appear to be condemned in a place enjoying similar atmospheric conditions to those at work in Leeds.

The Sketching Club's programme for the coming season received consideration and numerous suggestions were made towards formulating a series of visits.

A selection of works by the students was exhibited, comprising studies of ancient buildings, suggestions for imaginary buildings, and numerous sketches of architectural subjects at home and abroad.

A general meeting, the last of the present session, was held on Thursday evening, March 17, when Mr. S. D. Kitson, F.R.I.B.A., read his paper on "Carr of York."

## THE USE OF COLOURED MATERIALS IN BUILDING.*

The use of coloured materials in building goes back to the very roots of history—indeed, if we dig in the garden of Eden we find them there. The charm of colour—its protection as well as its ostentation—has been felt by all animated creation, and man has used colour, in the heraldry of his dress and in the heraldry on his buildings, as he has used music: to express emotions, too lengthy and too abstract when put in terms of words, in a way at once intelligible to the members of his tribe, and also directly recognisable by others, his aliens and his enemies. The cries of pain and victory, of sorrow and of joy, are sounds substantially common to the whole human race; the heraldic use of colour is less international, but the pennon and the gonfalon—the helm and, in these present days, the uniform—explain, in a kind of shorthand in the day of battle a mass of personal and national facts in such a way that the eye of a foreigner can at once grasp and understand, where language might be unintelligible and would certainly be too slow and too indefinite. In the garden of Eden, which we now call Mesopotamia, the use of coloured buildings came about from the pressure of constructive conditions. The great walls and terraces which surrounded and formed the cities of the plain were built for the most part of sun-dried bricks made from the alluvial mud and clay, their sole building materials so far as masonry and brickwork were concerned. These bricks were adequate for all their needs, so long as protection from rain could be secured. For the action of frost they had little to fear, but rain falling on these mud bricks melted them into slime and brought about their ruin. Moreover, mud bricks were a poor defence against hostile attacks; excavation into them was easy, battering rams disintegrated them, the stones from the catapults effaced their towers and battlements. The remedy was to plate them with a coat of mail, and kiln-burnt bricks were found the most easy way of making this veneer. But fuel was scarce, kiln-burnt bricks were precious, and there were miles of wall to be protected. It was found that by coating these bricks with an easily-fluxed glaze, they could be fired at a lower temperature and yet be more durable than the unglazed ones. Later on, in the time of Darius, a kind of conglomerate, akin to concrete, was used, which would glaze when required. The Egyptians also had a stone which would stand the necessary heat for melting the glass.

The immense shapeless table lands and mounds that mark the site of Babylon show the deliquescent action of the mud bricks. They are the remains of the great walls and terraces that, range upon range, rose up majestically out of the wide plain, tier upon tier, ever higher, till on the topmost level stood the king's great palace; and soaring yet higher was the tower of observation, from which the astronomers watched the courses of the stars, recorded the nightly roll of the constellations, dictated the chronology of the seasons, the time for sowing, the time for ploughing, the advent of the waters, the rage of the Dog Star. On the overthrow of this gigantic and amazing civilisation of the Chaldees, and the ruin of the elaborate system of irrigation that made the lands between the Tigris and Euphrates fertile as a garden, the huge towns became all too vast for the shrunken population, the empty buildings were stripped of their costly coverings, the walls, no longer needed to protect a folk beneath even the notice of marauders, were treated as quarries for material to fence round their sparse holdings from wandering animals and predatory neighbours, and the winter rains washed away their shape and dissolved them into mounds of mud. There they remain, great silent heaps of soil, to attest the immensity of the once mighty Babylon. Accident at first probably threw a stain into the glazing of the bricks, and experiment led the makers to discover the methods of producing coloured glazes. Thus came about, some 6000 or more years B.C., the axiom in the Eastern mind that buildings of importance must be sheeted for their preservation, and where the buildings were to be monumental or palatial the most royal sheeting was all glorious in colour. This ideal was accepted throughout the East—the Egyptians glorified their buildings by inlay, by enamel, by paint; the Chinese by plaques of enamelled faïence, by wood in coloured lacquers, by roof tiles in brilliant colours. It was accepted by the Greeks, who heightened their sculptured marble work with colour, and by the Romans, who adopted the Greek methods of decoration, but in far greater profusion. The Babylonish method of decorating with glazed plaques and bricks was perpetuated in Asia Minor and Syria, and under the Arab conquerors was carried into India, and along the coast of Africa into Spain. Where marbles were obtainable the plating was done with thin sheets of this material; patterns and pictures were formed with the tesseræ made of coloured glass, or from fragments of the most brilliantly stained marble; rivulets of gold sparkled and ran along the mouldings and across the panels, and the paint brush completed what the statuary and mosaicist attempted to fulfil. Whilst Italy was being overrun by desolating hordes of northern barbarians, Byzantium was taking toll of the stream of commerce passing through her gates, intercepting the choicest treasures and accumulating in her church of Santa Sophia and in the Emperor's palace the *ne plus ultra* of all that was valuable in art and costliest in decoration. Ravenna was following suit in a more modest way, and Venice was taking form amidst the shallows of her lagoons. Sicily, in the hands of the Normans, was luxuriating in the fusion of three civilisations—the Greek, the Saracen, and the Northman. The Crusader, on his return home, had strange tales to tell of the wonderful buildings he had seen on his way to the Holy Land; the marvels of Byzantium, the enchantment of Damascus, the long siege of Acre, the deadly stagnant waters near Alexandria where dwelt the Soldan of Babylon, the precarious sovereignty of Jerusalem. His listeners were not to be crushed by his extravagant accounts of the joyous revelry of colour. The craftsman of the twelfth century needed no spurring. The marble of Carrara could vie with that of Pentelicon or Proconessus. All Asia had nothing to show that could not be matched in Europe. Florence, Pisa, Siena, Lucca, churches like Le Puy in Auvergne, grew up in coloured stones and marbles; brickwork coquetted with marble columns and enrichments; mosaic lent its aid to the glorifying of the cathedral fronts, as at Orvieto and the many examples in Rome; terra-cotta, at first unglazed, becomes in the hands of the Della Robbia family the supremest examples now left to us of coloured sculpture. In the pictures by Mansueti we get an idea of the profusion of colour Venice displayed, even

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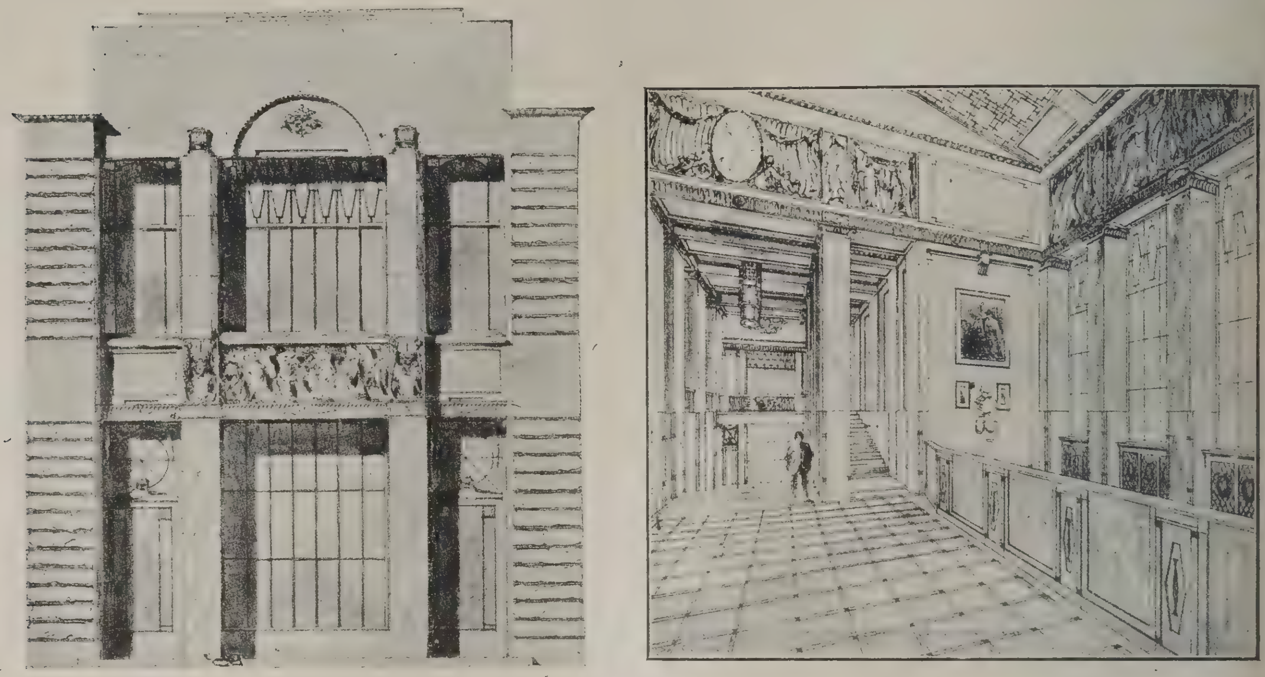
* A paper read at Carpenters' Hall on March 9 by Mr. Halsey Ricardo, F.R.I.B.A.

## MODERN EUROPEAN ARCHITECTURE.

### RUSSIA.



[From *Zodtchy*.

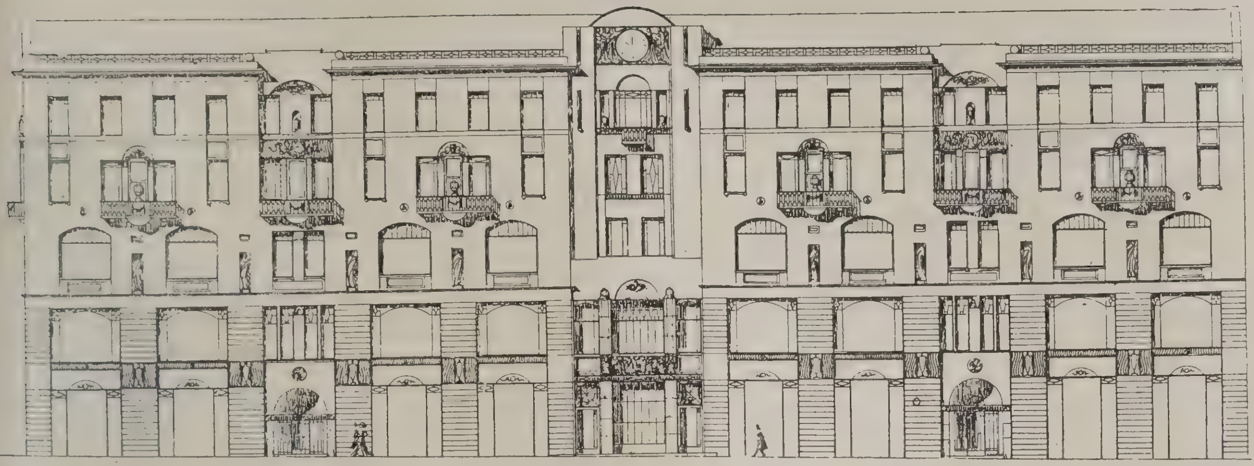
FIRST PREMIATED DESIGN FOR COMMERCIAL BANK, KHARKOV.—M. L. SOLOGOUB, Architect.

up to the sixteenth century. But by now the crafts had specialised into different branches of the building craft; the image maker was become the sculptor, the painter was to be found learning his trade in some studio without the cathedral close, the glass to the windows was imported from some specialist whose factory was miles away or in foreign lands. The printing press released the scribe from his toil of illuminating his manuscripts; the goldsmith was become as secular as the armourer; the masons' guild became bare and independent of these artists, and their almost only interest was centred in the stones they were handling. Artists, too, who had founded themselves on the careful examination and measurement of the bleached relics of exhumed antiquity and were impressed with the sculptured finish of the workmanship, and assumed that the colourlessness of the specimens was their proper aspect, began to talk about "proportion" and "light and shade" and to dominate the masons, calling themselves architects. Colour vanishes from the buildings externally. The wayward diapers woven in the coloured brickwork, the chequer of stone and flint, were considered as scarcely serious enough for the grand style. It might be pardoned in the stables; it was inadmissible in the mansion. Gradually the true working and the perfect jointing of the stones became all that the mason had to take pride in in his craft, and the stones were not always of his choice, nor those from quarries with which he was familiar. Into the midst of this languor of weakened tradition came the Gothic Renaissance, with the avowed intention to replace the stiffened tradition of workmanship by the vital and exuberant tradition of the thirteenth century. The attempt was really foredoomed from the outset, and it, together with the sudden expansion of the use of machinery in every direction, played havoc with the methods and experience of the workman; it puzzled and disorganised him, and made him more than ever dependent upon the senseless and outlandish, to him, drawings and instruction that he was receiving from the architect. It took away from him his initiative, his desire to take advantage of the varying peculiarities of his materials, their humours and their tempers, qualities that you can only discover at the times of handling them. These conditions of docile submission to the paper designs of the architect still exist, and they were met by Mr. Butterfield in the frankest and most logical way in his methods of building. He schemed, in the quietude of his office, elaborate examples of the use of coloured materials, and these were set down fast on paper, stone for stone, brick for brick; there was no excuse and scarce any opportunity for going wrong in the actual building; everything had been foreseen and provided for. This dominance of a single mind over both men and material is in his case less oppressive than it would be in most others, because he was a great artist and he had trained himself on mediæval methods at a time when many examples of these methods remained unrestored and consequently instructive. But for all that, one is conscious of the difference there is between the scholarly dictation of the use of building material and the Gothic craftsman's use of the same on the scaffolding. Time will bring its own special touch to Mr. Butterfield's work, developing and accentuating the individual characteristics of the well-drilled units, fusing and blending the opposition of their colours; yellow brick and red brick will play at interchanging their tints till we get the flecked russet of the apple, and the black headers will make themselves the repository of the rainbow, the iris centres to the mingled hues vibrating around them. The dance of diaper will calm down, giving us the feeling of a rich woven fabric that adorns and distinguishes the splendid framework which it clothes. Time's hand is already justifying Mr. Butterfield's confidence in its action.

The Norfolk house has much more fellowship with the mediæval craftsman; beyond the main lines of the design and the spaces for the windows, laid down at the outset by the exigencies of the plan, the walling has been built to suit the caprice of the material almost as much as the humour of the architect. Some of the materials must have been a good deal startled by the use to which they found themselves put. Roofing tiles, for instance, that might reasonably expect to be accommodated with a lath on the back of a rafter, find themselves summoned to pack themselves into a lintel, or wind themselves into a chimney-stalk, or help form patterns in the walling, whilst the roof on which they counted to rest gets itself covered by a distant branch of the same family, the pantile. The materials for the most part were local; the flints and gravel came out of the site and were made, with lime, into the concrete walls, the largest flints being reserved for the facings. Bricks and tiles came from near by. A golden brown sandstone, sparingly used, had to be imported from near Sandringham; the roof tiles, starting as pinkish red, have weathered to a warm brown. These are the elements evidently of a beautiful colour scheme.

The colouring to the house in the Addison Road has been arrived at by another route, and belongs to a different category. Instead of using Nature's materials and painting from her palette, the colours in this case are all artificial; instead of the natural colours of brick, terra-cotta, and tiles, we have the materials covered with a glaze, and that glaze either whitened or stained with colour as required. The justification of using such materials, on which the wing of Time scarce brushes, is the corrosive atmosphere of our manu-

## MODERN EUROPEAN ARCHITECTURE.
### RUSSIA.



[From *Zodtchy*

FIRST PREMIATED DESIGN FOR COMMERCIAL BANK, KHARKOV.—M. L. Sologoub, Architect.

facturing towns. Even supposing we could free the air from the soot and grime that pours from our chimneys, we cannot stop the issue of the products of coal combustion in our factories and on our hearths. These gases, in our moist climate, become solutions of acid which disintegrate our marbles and stones before they have had the time and the chance to get case-hardened. Brick and terra-cotta get befouled; to clean them is to hasten their destruction. Granite endures, but it is a grim material, almost repellent when polished and generally unattractive when not. We are driven, if we wish our work to resist the ravage of the biting air, to the employment of glazed surfaces externally, and we find ourselves almost forced by the nature of our materials to use colour. The glass that is poured over the surface of the terra-cotta and the bricks, to make them imperishable, is liable to discoloration in the kiln, and moreover, being in fact a stained-glass window spread thin upon a film of porcelain, is capable of nearly as magnificent colouring. To refuse to avail oneself of this property would amount to misprision of the qualities of one's material and to confine oneself to its limitations. The fact that glazed bricks and glazed terra-cotta are virtually unchangeable—that the years that roll over the building will do almost nothing to blunt and soften the sharp edges of the moulded work, to coax interchange and play of colour from one brick to another, from one material to another—are limitations indeed, and we want some considerable advantage on the other side to think it commensurate. Durability is good; that the building is impervious to wind and rain is a considerable merit; that it is easily and inexpensively cleaned and comes up smiling under a good wash down; and, moreover, since the surface is non-absorbent, the cleaning process washes the dirt off and away. But these good hygienic qualities are scarcely forcible enough to overcome one's repugnance to the imperturbability of such a material, were it not for the charm of colour that is obtainable. The gamut of colour is the same as in a cathedral window; what you choose to call for you can command to come. The almond blossom hue that flushes the sea front of the Doge's palace at Venice can be fixed here in London; the stained amber and gold of the marble sheeting to St. Mark's can be matched and displayed in Trafalgar Square, not transiently, but for always. Nor can it be questioned that colour is desired in our streets. It is pathetic to note the agony of effort that people make to invest their houses with a little colour and so mitigate the drab universality of our city. Ivy, ampelopsis, vine, laburnum, and magnolia are laboriously invited to smother the walls, and no end of pains are taken to forward their growth. The National Gallery has made itself widely popular with its strip of green grass, its fig trees, and its shaped trees in green flower-tubs. It has become the custom when forming a new street to plant trees at the same time, not, I take it, for shade, but for the refreshment to the eye of colour. Every evening thousands upon thousands escape by every railway from the masterpieces of correct architecture and superfine sculpture in our streets to the shelter of the country, where the earth is green about them and the heavens blue above them. Would it not be well to temper their lot to the prisoners who must remain?

## "CASTLES IN THE AIR."*

*(Continued from last week.)*

UNTIL we come to realise the blessed functions of trouble, and admit the power to be gained through it, we shall be ruled and conquered by it. Only when we feel the beneficent power behind it, and recognise His loving purposes, then, and then only, shall our darkness melt into light, and we shall regard all our troubles as blessings in disguise, to be interpreted by us and made to issue in good.

This searching for good in painful things will supply us with loads of material for our castles.

The more sensitive we are, the more we must suffer; therefore the more needful it becomes that we should search for the good purposes of our pain.

If this is not a rational theory, I fail to see what we are to rely upon to hold us up and give us courage when we feel outcast and no one wants our best work—a feeling too often known to art workers in these days.

Let us not deceive ourselves by going forth as artists when all the while our main object is to make money, and our true intent to degrade our art to the market value. Go on your way, but do not mistake it for anything better than it is, viz., a ministering to the flesh, and a sacrifice of soul to body.

The purpose of moral consciousness is gradually to reverse this order. We must more and more learn to sacrifice body to soul and value giving more than getting, if we would create beauty.

Carlyle, who was neither artist nor sickly moralist, has written, "I honour him who is seen toiling for the spiritually indispensable; not daily bread, but the bread of life. Is not he too in his duty endeavouring towards inward harmony, revealing this, by act or by word, through all his outward endeavours, be they high or low? Highest of all when his outward and his inward endeavours are one; when we can name him artist; not earthly craftsman only, but inspired thinker, who with heaven-made implement conquers Heaven for us."

The pursuit of art should be an indication that the seeker is trying to build up the good, the beautiful, and the true; and to dwell on what is lovely and of good report rather than tread the warpath and fight the evil and ugly. The love of beauty should drive out hate and tune our minds for castle building.

The true and noble object of refined sensibility is mainly to overcome the demon of selfishness, and so make us more loving. If thinking upon and seeking beauty does not do this, it is idle and vain. Building castles in the air is collecting in the mind all that is lovable and lovely. Ruskin says, "You never will love art well till you love what she mirrors better."

Look on the birds of the air; do not their castles teach us a lesson? Are they not labours of love, wrought with all their faculties, and as perfect as their powers allow? We cannot behold them without feeling a glow of reverent pleasure. Should we ask less of ourselves than we see bestowed by the sparrow? A full and loving bestowal of the best instincts of our nature, body and soul.

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* A lecture delivered by Mr. C. F. A. Voysey on March 2 at Carpenters' Hall, London Wall, E.C.

The close attention we give to orders of architecture, and symbols of foreign thought, and all the residuum of human activity, will clog rather than lubricate the wheels of thought, unless we are castle building all the time, and collecting all the living forces of mind and heart out of what we study.

Would we not rather hear our work called thoughtful than quaint or original?

To some extent we see what we look for and are blind to what we cannot understand.

Every truth we utter or depict depends in great measure for its future life on the thoughtful heart that hears or sees it. So my usefulness in presenting to your minds such truths as I am blessed with depends on the degree of sympathy you have in yourselves with what is decorous and generous.

It is of little avail to have spasmodic fits of misty idealism. We need a calmly reasoned system of moral law, clear and defined; on this we collect and build in order the castle in the air, which is to be the storehouse of everything beautiful we can conceive.

We would have our castle bell to sound with sweetest melody at the exactly appointed moment, so that travellers might set their watches by our comings and goings, and so be reminded of the value of punctuality and its extended form, constancy.

We must believe that the building of castles in the air will train us to shun all that we feel impure. If we are sincerely seeking beauty, we shall turn away and not look twice on ugliness. And by degrees we shall live more and more in our castles and see no evil. And such condition of mind will do more to help our fellow-workers than all the efforts we make to convert them to our own way of thinking. Fly with me to my castle if you will, but I will not press you to pull down your own, or even so much as dare to criticise it.

The tendency to specialise is another outcome of our materialism, it is a help in the accumulation of wealth. It may increase our capacity in the direction in which we specialise. But it may also prove proportionately detrimental to our higher nature.

We often hear men say they are in business to make money. And that is their speciality, which they, consistently with their own point of view, divorce from what they call sentiment, but what some of us call moral, mental and spiritual activity. To them, all that I am saying will seem very ridiculous.

We do not want extremes of either point of view, but we do need a mixture. Cannot the craftsman by his castle building instil into the home life of the business man moral and mental qualities manifest in everyday articles of use, which shall make him long to blend those qualities of home life with the Beelzebub of business? Many a man is only kept steadfast to his business by the little element of human thought and feeling that remains in it. But for that he would go mad. Beware then of multiplying trading governments, corporations and companies. Castle building is impossible to such. It is for individuals only; it requires secrecy. Only our nearest and dearest can ever be witness to our building. Only the deepest sympathy can unlock the door of our castle.

In spite of the fact that corporations and companies have made machinery to imitate every physical function, and are doing their utmost to turn men into machines, there are countless numbers earnestly struggling to create beauty. Tons of literature is produced to show how it is, or should be done. And some companies, like the Carpenters', are recognising the importance of cultivating those personal qualities which we are now discussing. But it is rare and cannot fail to establish them in the grateful memory of many a craftsman.

May we not take encouragement from the thought of future historians, comparing us of the twentieth century with the craftsmen of the thirteenth, when people were less educated and much more spiritual? No one talked about art, but everyone loved beauty. Even the village blacksmith wrought beauty into every bar he handled. They all built castles in the air. Their heads were full of pretty legends, and angels were as familiar to them as policemen are to us. And yet, we are very anxiously and very earnestly trying to get at beauty, and even the stockbroker sometimes tries to help us with his sixpences. Is it not more credit to us to be struggling for beauty, with such odds against us, than it was to the thirteenth-century craftsmen and those of previous centuries?

The past is too often held up to us to make us feel ashamed of ourselves, instead of which we want encouraging to do better. Colour is a sure revelation of a people's spiritual condition; the more spiritual activity the brighter the colour.

In the East people were always much more spiritual, more superstitious and more imaginative, and proportionately fond of bright colour. In our own country the ignorant peasant and bargee paints his farm carts, wheelbarrows and barges in bright and cheerful colours (or used to). And the nearer we approach to city life the blacker and more gloomy our colour becomes. The more absorbed we are with earthly interests the greyer becomes our lives.

Castle building will at least help to preserve our sense of joyous colour, and in our own private castle what infinite scope we find for the exercise of harmony and joy. How bright we can be, rejoicing in freedom from fashion and the tyranny of expert authority. We are also emancipated from all forms of degrading fear. Only one ennobling fear remains to steady us, and that is the fear of ugliness.

And furthermore we are drawn towards our fellow-creatures by our thirst for every spark of brightness, every beam of strength, every atom that is beautiful and helpful. And while thus occupied, we cannot be reviling or rebuking them.

Kind, candid friends will, of course lament that our actions fall so short of our castle building, but would they be any better if we never built any castles at all?

We must try and gather strength from them to belie the taunt.

Ruskin tells us, "The true strength of every human soul is to be dependent on as many nobler as it can discern, and to be depended upon by as many inferior as it can reach."

And another wise man has said, "We make people what we call them."

So we are forced to admit that we depend on one another, and I think it is one of our highest blessings.

(*To be concluded.*)

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) makes a feature of the architect's part in the war against tuberculosis, both in an article on the planning of sanatoria and in illustrations of tenement houses for families, one or more members of which are victims of tuberculosis.

*La Construction Moderne* (Paris) has an interesting article fully illustrated of the Benedictine Abbey of Solesmes, near Sablé (Maine-et-Loire), which the French Government is desirous of selling, but which is too big for a private residence and unsuitable for a factory, so that no purchaser has come forward, although the price has been reduced from one million to a quarter million francs.

*Il Monitore Tecnico* (Milan) illustrates fully and describes a new pleasure palace, the Kursaal Diana at Milan, which combines a music hall, restaurant, hotel, and a hall for playing the game of Pelota.

The *Architectural Record* (New York) has an article on "The Apartment House," which is a description with illustrations of some of the more recent examples of flat-building to be found in Germany. In a paper on "Factories and Their Fire Protection" is given a striking view of a factory in which a fire occurred during construction. One 8 inch by 10 inch timber beam was used because the supply of 10 inch steel joists ran short; this, though charred, remained firm, but the steel joists (unprotected) are twisted and sagged in every case.

*Engineering Record* (New York) gives a useful paper with illustrations on "The Sea-wall in Connection with Buildings," read before the Connecticut Society of Civil Engineers by George A. Orroll.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### Oxford Colleges.

Sir,—I hope you have not given up publishing the photographic pictures of Oxford Colleges. It is a long time since the last one appeared in your paper. I have been keeping these views separate with the hope of ultimately binding them up in a volume, to be followed by a similar collection of pictures of Cambridge Colleges.—Yours very truly,

Robert Gladstone.

Woolton Vale, Liverpool: March 11.

[We shall continue our illustrations of the Oxford Colleges after Easter, when our series of views of Llandaff Cathedral will be completed.—Ed.]

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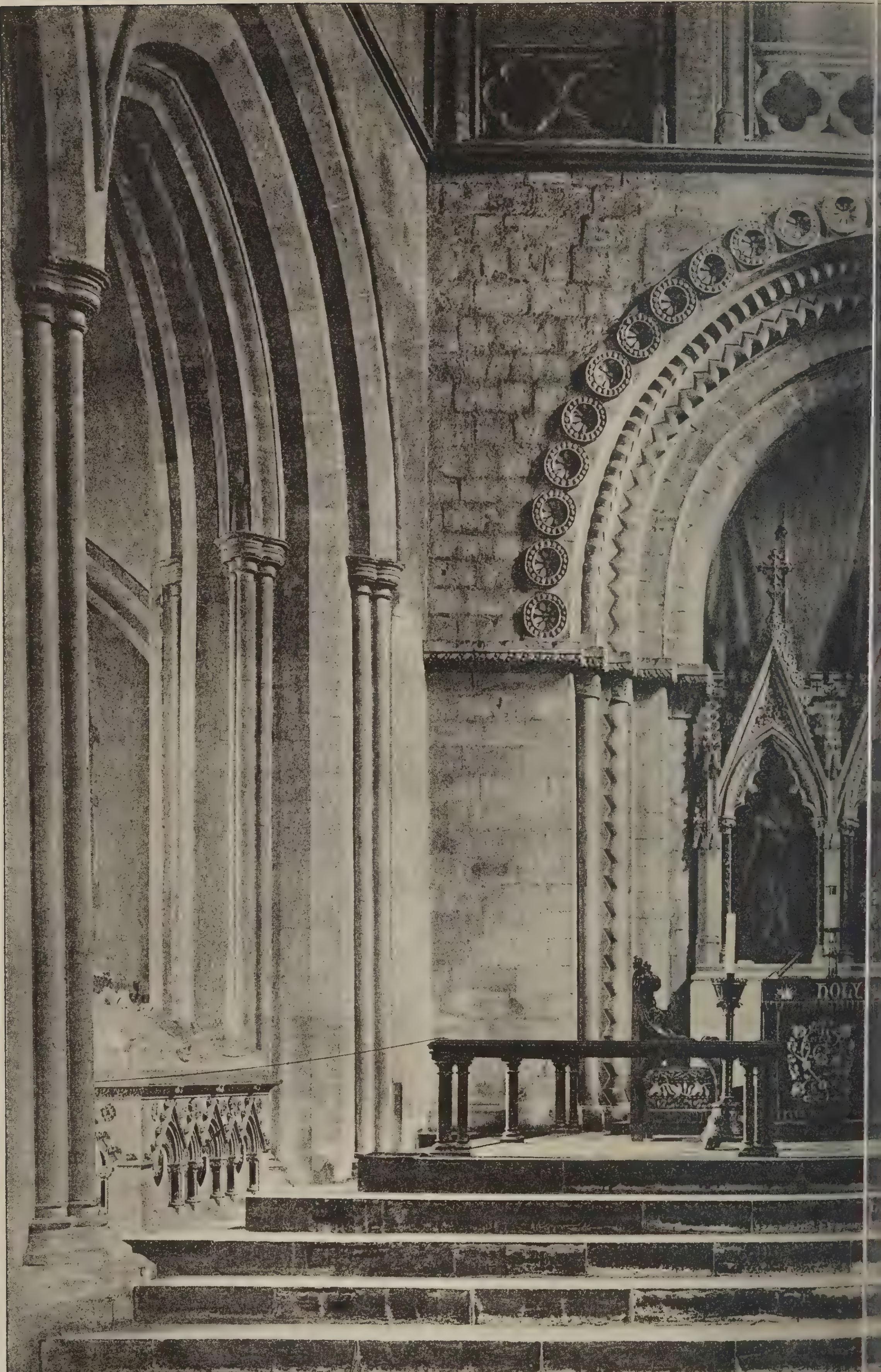

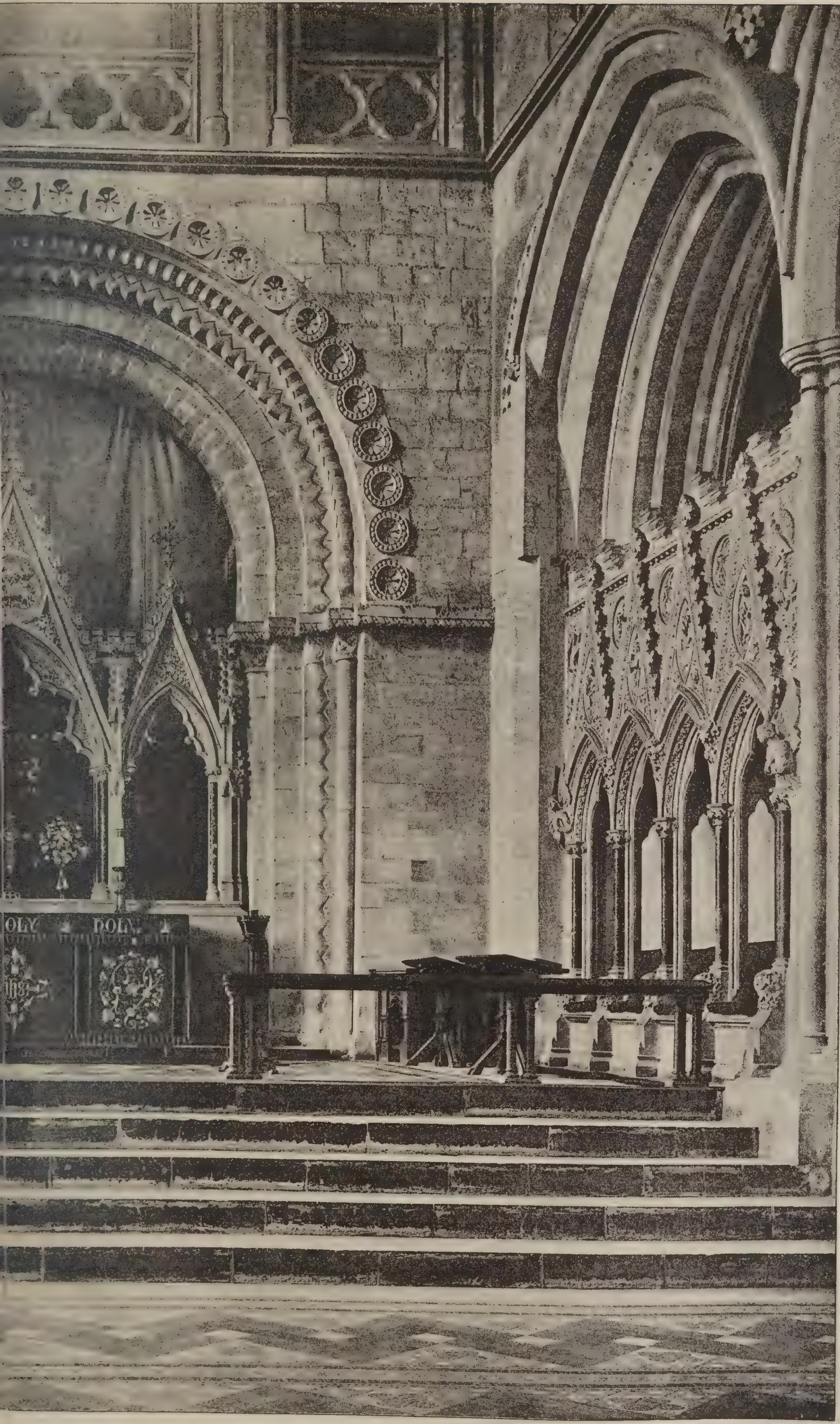

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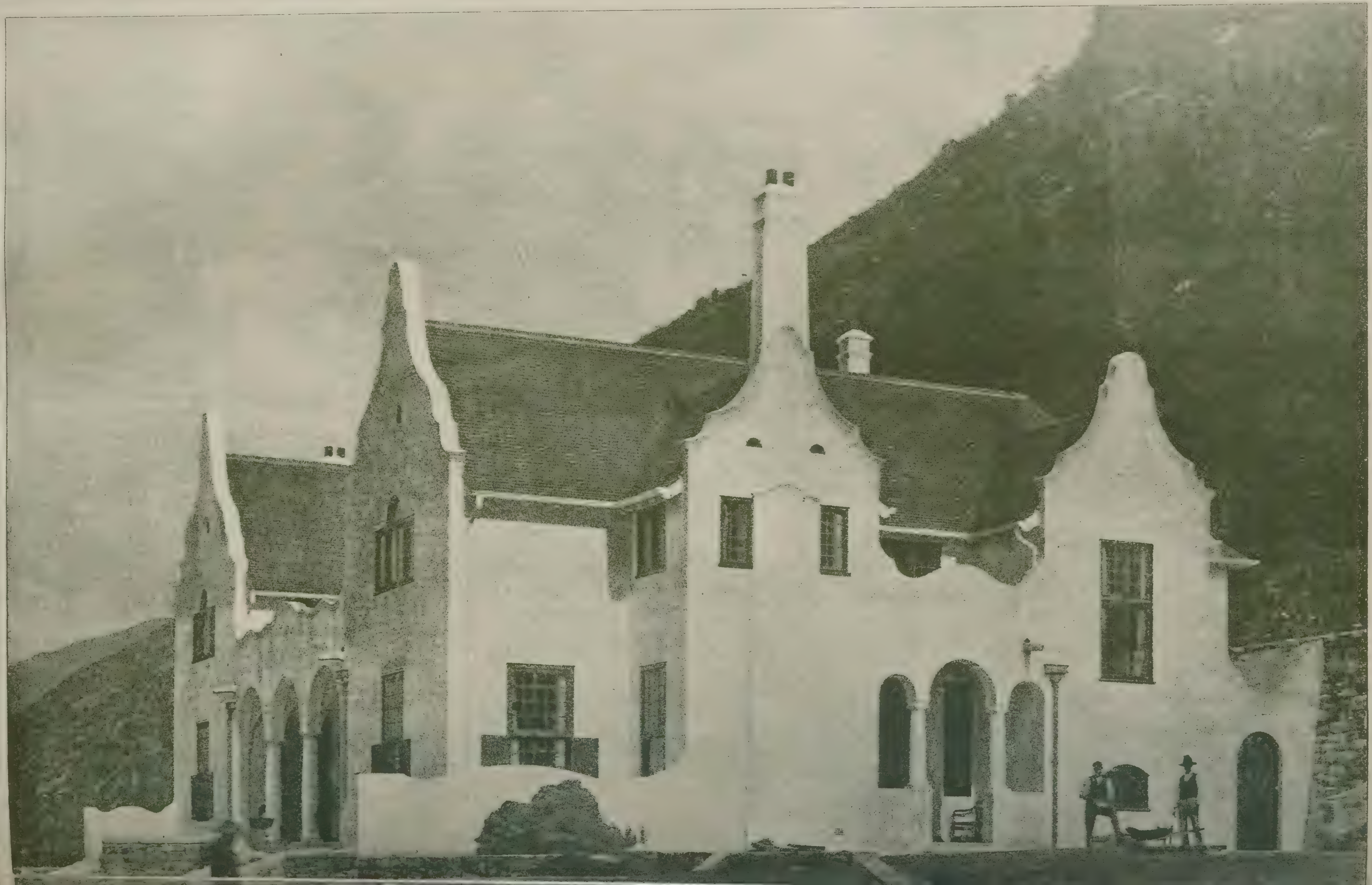

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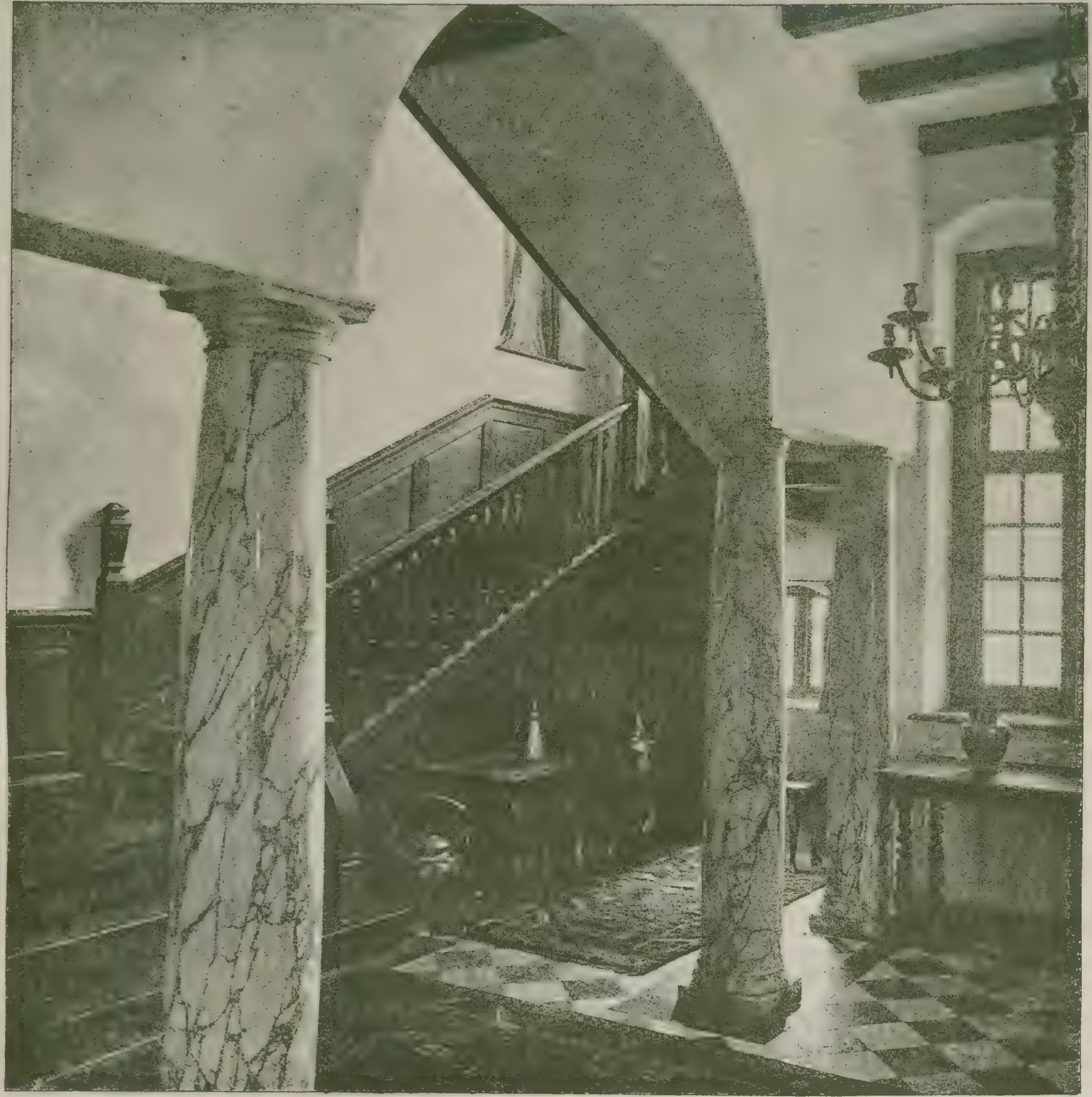

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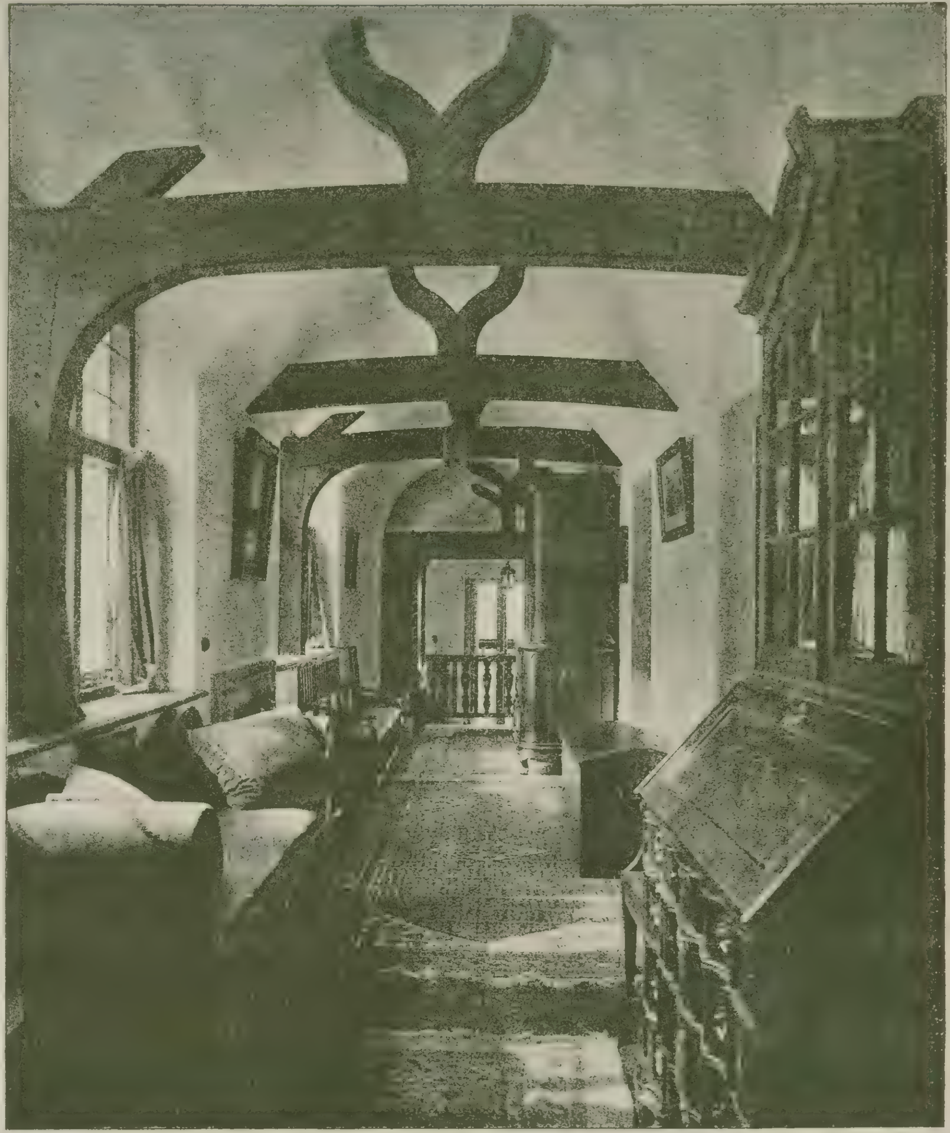

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"RUST EN VREDE," MUIZENBERG, CAPE COLONY.

Messrs. HERBERT BAKER & MASEY, Architects.

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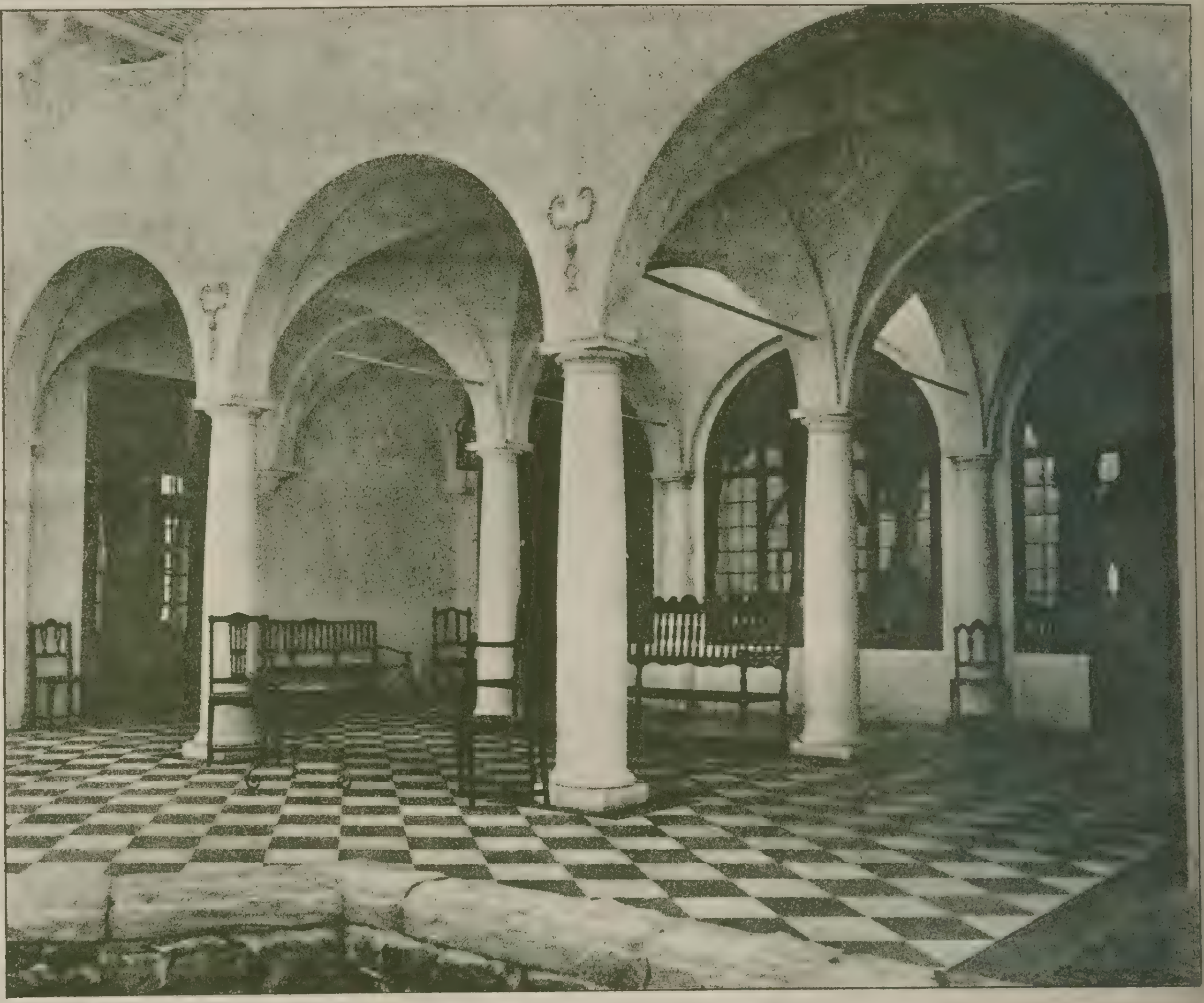
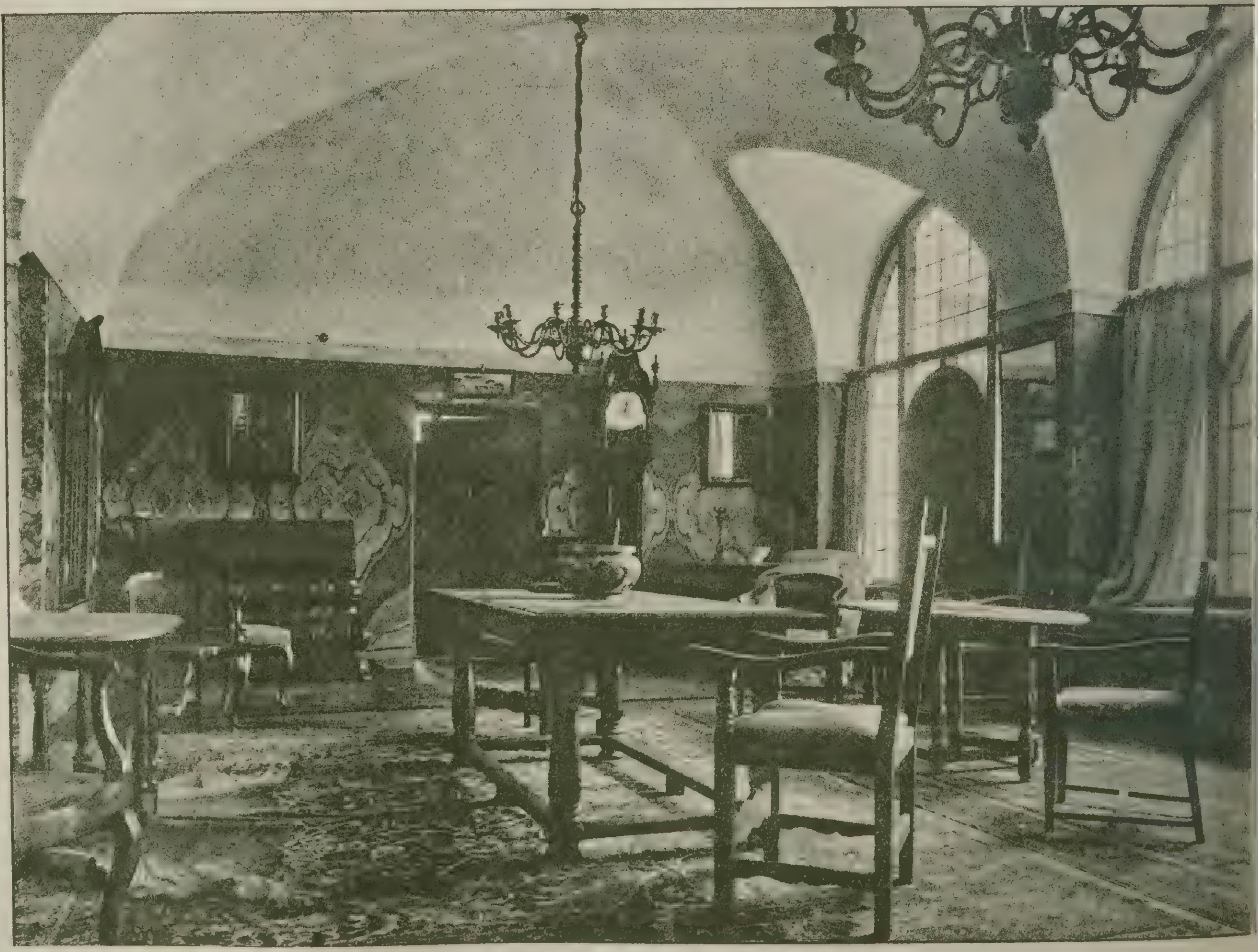


LOGGIA, LOOKING TOWARDS SEA.



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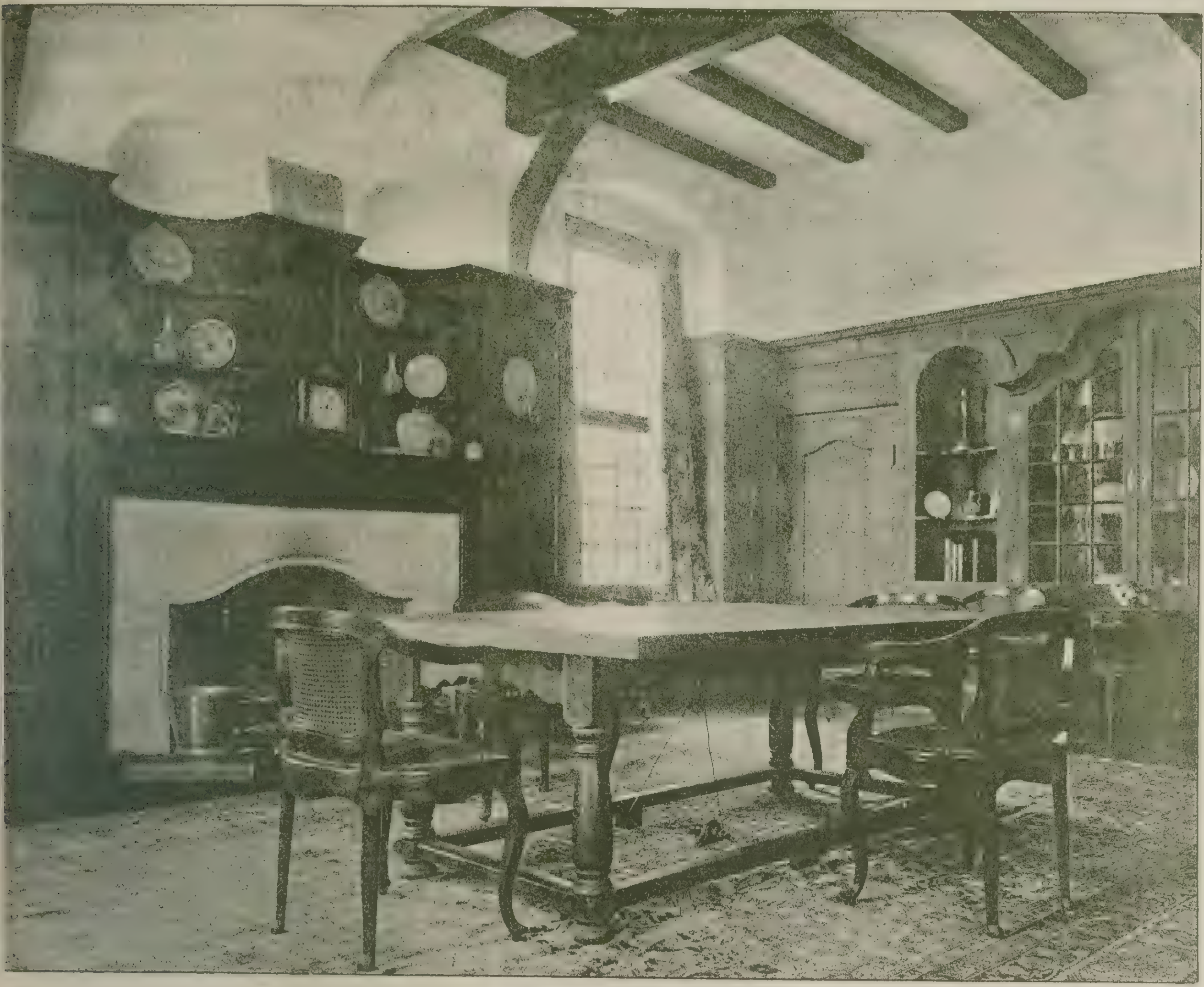
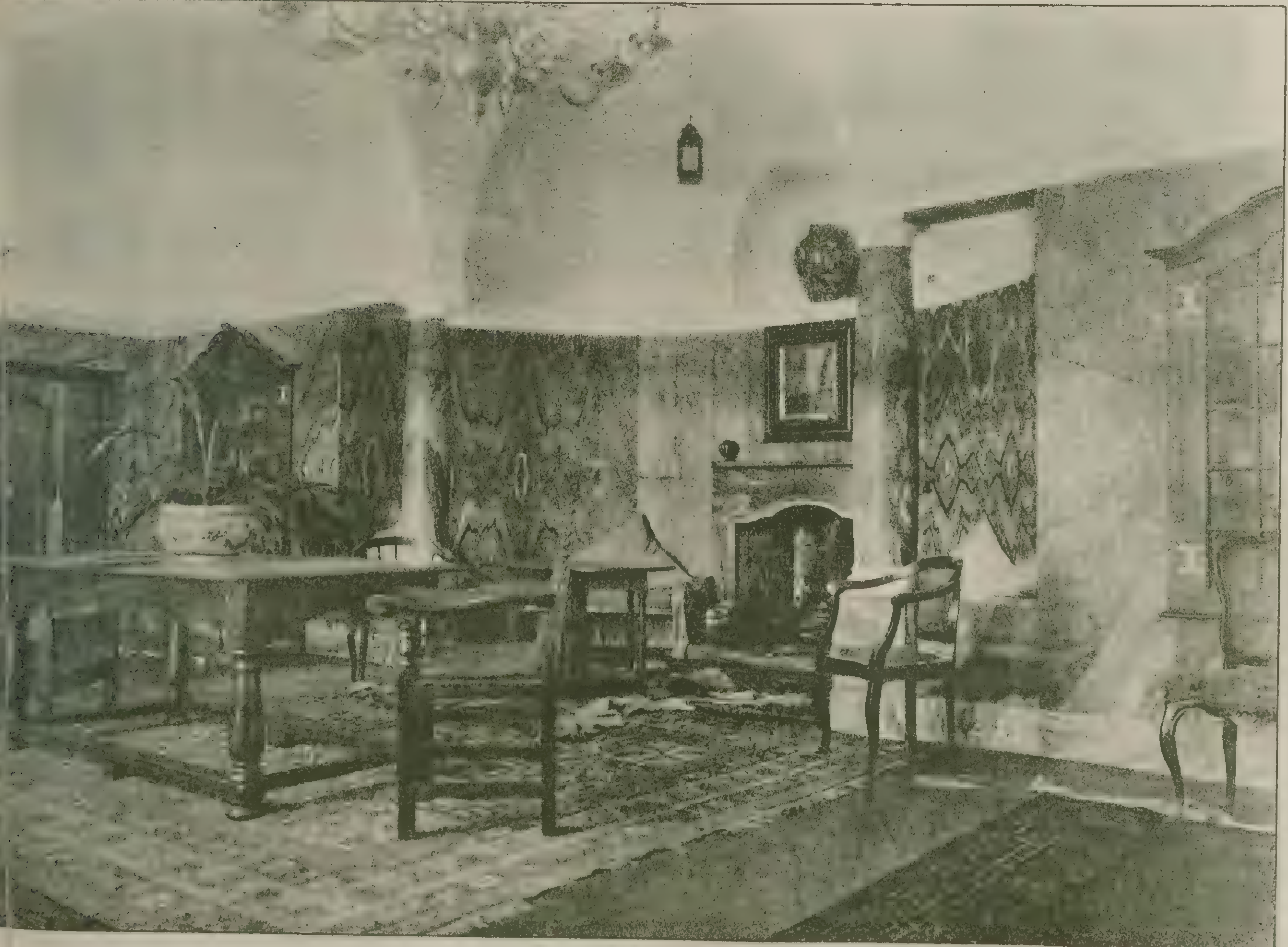
“RUST EN VREDE,”

Messrs. HERBERT



DINING ROOM.



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## FORTHCOMING EVENTS.

*Wednesday, March* 30.

Carpenters' Hall : Paper on "Sculpture as Applied to Buildings," by Mr. F. W. Pomeroy, A.R.A.

Edinburgh Architectural Association : Paper on "The Spirit of Mediæval Art," by Mr. J. B. Stoughton Holborn, M.A., F.R.G.S. (Report and Exhibition of Measured Drawings Competition).

*Friday, April* 1.

Leicester and Leicestershire Society of Architects : Students' Evening.

*Monday, April* 4.

Royal Institute of British Architects : Paper on "Architecture on the Eastern Side of the Adriatic," by George Hubbard, F.S.A., F.R.I.B.A.

*Wednesday, April* 6.

Royal Sanitary Institute : Paper on "Sanitary Aspects of Floods and Measures to be Taken to Prevent Epidemics Arising Therefrom," by Dr. A. J. Martin, of Paris.

Carpenters' Company : Paper on "The Craft of Repairing Buildings," by Mr. Thackeray Turner, F.S.A., F.R.I.B.A.

## COMPETITION FOR WELSH NATIONAL MUSEUM.

MAGNIFICENT collection of drawings is made up by the 130 designs that have been submitted in mpetition for the Welsh National Museum and are now ing exhibited in the old Town Hall of Cardiff. They e worth going a long way to see as evidence of the gh-water mark of English architectural design at the esent day. But the pity of it! To think that of the 0 only four receive any recompense for months of the thors' expenditure of hard work, hard thought, and rd cash. At a moderate estimate, the cost of preparing ese 130 sets of drawings must have averaged at least 0*l*. apiece, and thus exceeds the total amount of the nmission to be received by the successful architects en the whole building is completed.

If ever there was an instance in which a double-relled competition was imperatively desirable it was s. There were two questions of vital importance that ed every competitor before he began to adumbrate his eme: first, the proper relation of the new National seum to the buildings already erected in Cathays k, the Law Courts, the City Hall, and the University; ond, the proper relation of the exhibition galleries to reserve collections in the internal economy of the seum.

Each of these questions admitted of at least two wers, and hence in their combination there were at st four solutions, of which any three might be wrong. amount of skill in planning an admirable and effec- interior, in designing detail, or in draughtsmanship ld compensate for an initial error of judgment. Nor the correct answer to the primary questions at all ious, to judge from the vital differences to be found e four designs that have been selected by the assessors reward.

Many minor questions, but nevertheless of importance their bearing on the design, required satisfactory wers. Should the main entrance be on the south, ng the approach from the city, or on the west, the er and more important frontage? Should the public eries be all on one floor, and, if so, which; or might be on two or more floors? Where would be the situation for the administration, for the lecture tre, for the aquarium, for the children's museum, he refreshment room?

ll of these questions, both primary and minor, might been answered by competitors in small-scale sketch as, say 40 feet to an inch, and a perspective sketch sufficient clearness to have enabled the assessors to t a dozen promising schemes at a tenth of the cost e competitors.

The winning design, by Messrs. A. Dunbar Smith & Cecil C. Brewer, is unique in its solution of the primary questions, and as we see that solution we cannot but recognise its correctness. The Museum must be a bigger building on plan than the Law Courts to provide the accommodation required without going to such a height as to dwarf the City Hall; hence the first impulse of every competitor to make the Museum a subordinate pendant and completion of the group that Messrs. Lanchester, Stewart & Rickards's beautiful buildings have commenced must be abandoned. Messrs. Dunbar Smith & Brewer have designed a building that, although larger than the Law Courts, groups modestly with them and the City Hall, with which latter it is sympathetically allied by the adoption of twin axial lines in the length, one following the transverse axis of the City Hall and the other ranging with the centre of the road at the rear of the City Hall.

But the great superiority of the winning plan is the clever solution of the relation between the exhibition galleries for the public and the reserve collections for the student. The latter form the external range of rooms and the former the internal, thus public galleries and reserve collections are side by side, adjacent and yet separate. The large internal quadrangle thus formed is divided into three approximately square portions, the northern and southern of which are occupied by the similar and symmetrical halls, with alcoves, required for the departments of history and antiquities and Welsh natural history, leaving a garden in the middle, in the centre of which is the aquarium.

The adoption of the principle of public galleries and reserve collections side by side necessitates the provision of two floors for the public galleries, and the authors have located the departments of art, botany, and zoology on the first floor. The requisite area for the reserve collections is obtained by the use of a mezzanine floor. The entrance to the Museum is in the centre of the south front, leading to an entrance hall from which is at once entered the Welsh natural history department.

In their external treatment the angle pavilions of the City Hall are repeated in the south front of the Museum, and a central colonnaded portico marks its entrance. On the west side there are slightly projecting pavilions on the axial lines to which we have already referred. Thus the Museum is in complete harmony with the City Hall and Law Courts without, in spite of greater extent, losing that modesty which renders it an appropriate flank of the general scheme of which the City Hall is the centre.

The design placed second is by Mr. T. L. Vesper, and at once differs from the first by having the main entrance on the west side and a secondary entrance on the south.

The main entrance leads to a large hall, and this to the grand staircase to the first floor, on which are the departments of art and industries. The centre of the building is occupied by a hall for history and antiquities, which does not seem to us to be too well lighted, as above it is the lecture theatre. The reserve collections for the most part adjoin the exhibition galleries, but in the case of zoology the public space is on the ground floor and the reserve on the first floor. The plan generally is pretty and effective, but gives rather the idea of being too much cut up, and on the first floor there are dead-ends in both the art and industries departments, which means retracing of steps, a thing, in our opinion, to be avoided in museum planning.

The author does not attempt to follow closely the detail of the present buildings, but adopts a more restrained treatment based on the Ionic order.

Mr. Henry T. Hare is awarded the third place for quite a different type of plan, the main entrance being on the south and a subsidiary entrance on the west side, whilst the principal axis runs from south to north. On this axial line is a wide gallery with a cross central hall. The departments of zoology and geology are accommodated in this wide main gallery, and from it branch off those of Welsh natural history and of history and antiquities. Beyond the centre the departments of botany and of industries also branch off from the main axial gallery. Outside of the exhibition galleries are the reserve collections, but Mr. Hare has not been able to find room for all of these on the ground floor, and accordingly provides for the reserves of history and antiquities and of industries on the first floor, where, also, he has placed the art department. The refreshment-room is at the extreme north end of the main axis, the board-room, administration and library at the front. No attempt has been made at subordination to the City Hall, and, indeed, a great central tower, added to the general mass, would make the Museum the dominant building, which may be right as expressing the sentiment that the National Museum of Wales is more important than the City Hall of Cardiff, although wrong from the view that the central building in a group of three should be dominant. Who can say which is right? We think Messrs. Dunbar Smith & Brewer have won quite as much from the superior workableness of their plan as from the selection of the right sentiment.

Messrs. David Milne & J. William Hepburn in their design, placed fourth, are the only competitors amongst those favoured by the assessors who have taken the frontage lines of the University into consideration as well as those of the City Hall. They thus give a front block extending as far back as the City Hall and add an annexe, the west front of which aligns with the University, and which is arranged around an open quadrangle forming the service court. The main entrance in this design is on the west side, and leads through an entrance hall, vestibule, and central hall to the lecture theatre. On the ground floor are located the departments of geology, history and antiquities, art, zoology and botany, and industries. Some of the reserves are on the ground floor, but those for botany, zoology, history and antiquities are on the first. "We think this design owes its measure of success to the recognition of the University as an element in the planning of the *locale*. The treatment of detail is of the modern municipal Renaissance type, and does not attempt to follow closely that of Messrs. Lanchester, Stewart & Rickards. *(To be continued.)*

## NOTES AND COMMENTS.

Mr. William Burton, in a letter to the *Manchester Guardian*, has offered the following criticism on the enthusiastic account of the discoveries of Mr. Hewitt Myring by Sir William Bailey, which we print elsewhere; but apparently Mr. Burton's criticism is based on a short abstract of Sir William Bailey's paper that appeared in the *Manchester Guardian*:—

1. The typical specimens illustrated in your paper are by no means new. Pottery of the same type was illustrated or described by Brongniart in his classical "Traité des Arts Céramiques," 1844, and in Rivero and Von Tschudi's "Antiguedados Peruanas," 1851.

2. There is no proof, so far as I am aware, that this pottery is of great antiquity, not to mention 5,000 or 10,000 years. To mention the fact that no horses—pottery horses, I presume—have been discovered would only show that the vessels were made before the sixteenth century, when the horse was first introduced into Mexico and Peru by the Spaniards.

3. Your note states that "the Egyptian pottery of any dynasty was not equal to the best of these Peruvian specimens." This is an extraordinary statement, and I wonder what it means. The Peruvian pottery is obviously the work of a naturalistic, brutal race; while every artist recognises the severe intellectual restraint of those who were responsible for the Egyptian pottery of even the earliest dynasties. Besides this artistic difference there is an equally important technical difference. The ancient Egyptians had discovered the application of a glaze to pottery, and of a coloured glaze, "turquoise," that has remained unsurpassed for forty centuries. The Peruvian pottery is destitute of glaze, and is only coloured with earth tints—of the earth, earthy—like the primitive pottery of any other race.

One can understand and sympathise with the elation of a discoverer like Mr. Myring, and I am sure that Sir William Bailey will agree that the value of such discoveries is diminished when extravagant claims are made as to their historica or artistic value.

Sir William Bailey has replied in the *Mancheste Guardian* to Mr. Burton's comments, principally b referring more fully to the points in his original paper and he also says:—

I ventured the opinion that the best of this pottery i superior to the Egyptian of any dynasty. On second thought I might have said "any dynasty before Egyptian art wa influenced by that of Greece and Rome, say during the twent sixth dynasty, about B.C. 550," and I desire to reiterate tha the manifest quality of this Peruvian art impresses upon an student that there is internal evidence of intellectual libert They did not copy each other, and they did not make the plaster and clay ornaments from moulds, as sometimes th Egyptians did, in producing the effigies of the mummies whic have the beautiful blue enamel that Mr. Burton admires. Th "intellectual restraint of Egyptian art" is too long a subje to examine. They had no intellectual liberty. The artis were the mere unconscious tools of the priests, and the Sphin half brute and half human, symbolises the serfdom of the art. The people were kept in obedience and terrified in slavish subjection by huge stone monsters which filled the with horror. Art was the exclusive property of the Machiav lian priesthood, whose religion was the mere tool of tyrann and was divorced from all pretence of morality.

The authorship of the famous Flora bust attribut to Leonardo da Vinci by Dr. Bode seems now to b finally determined by the analysis made by Dr. Geor Pinkus of the wax used in its modelling, which is composition of lac, spermaceti, and beeswax. Th mixture was undoubtedly used by Lucas in work u questionably from his hands, so that the evidence is n practically conclusive that the Flora bust was not ma by Leonardo da Vinci, but by Lucas. When so gr an expert as Dr. Bode is thus deceived, the authentic of old masters must usually be dubious and the fictiti values put upon reputed antiques more than e ridiculous.

The lengthy litigation between the late Mr. William Mackison, continued after his death by his daughter, as trustee under his will, against the Town Council of Dundee, has at length been brought to a conclusion by the decision of the House of Lords. Mr. Mackison, as our readers may remember, was for many years the official and salaried engineer and architect of the town of Dundee, and during his term of office carried out much work which seems to have been acknowledged as outside the ordinary duties of his office; indeed in 1873 he was paid for extra services. Subsequently a dispute arose, and Mr.

Mackison was dismissed from his office, and then brought his action for 15,000*l.* as remuneration due for extra services. This claim the House of Lords has now decided to be untenable. There is no doubt that official engineers and architects are often eager to undertake work which is not properly within the scope of their duties, as these were defined at their appointment, and that their eagerness is partly inspired by the hope that extra work will bring extra pay. The law as determined by this case is clearly what to a layman appears to be common sense, that when an official agrees with a public body to give his whole time for a fixed salary, he has no just claim for extra pay, for having sold to his employers his whole time and energy he has none to give for extra services, and all work that he does must be considered to be included in the terms of his appointment.

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The tower of the church of St. Philip, the cathedral for the diocese of Birmingham, has for some time been suffering from decay of the stonework, which during the last few years has advanced to such an extent as to become dangerous to the public safety. During last year a special Tower Committee of the Cathedral Council was formed to ascertain what was the best course to pursue, and they have agreed unanimously that, in view of pressing needs of other kinds, no expenditure ought to be incurred which was not absolutely necessary; and that the present appearance of the tower should be altered as little as possible. On both grounds they decided against re-casing it. This would involve an expenditure of at least 5,000*l.*, and would make it a crude and unsightly object for years to come. The alternative plan which they have adopted is that of renewing those portions of the casing which are hopelessly decayed, and of dealing with the rest of it by a preservative process of a special kind. The cost of this alternative plan is estimated at about 2,000*l.*

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Messrs. William Whiteley, Ltd., have offered the price of 82,000*l.*, the valuation of the Local Government Board, for the public baths and washhouses and freehold site in Queen's Road, Bayswater, London, and the Paddington Borough Council has accepted the offer. The Borough of Paddington has thus made a very good bargain, for the site was purchased thirty-nine years ago for 8,500*l.*, and the buildings and plant cost 41,500*l.* The Borough Council has visions of improved and more convenient baths, and perhaps also a new town hall, out of the sum to be paid by Messrs. Whiteley.

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## OLDHAM TOWN HALL EXTENSION COMPETITION.

Owing to the rapid fall of the land from the rear of the present buildings to the boundary of the site, the competitors in general fixed the ground-floor level of the extension at the level of the basement of the present portion, and the first-floor level with the present ground-floor level.

Apparently the difficult part of the problem to the bulk of the competitors was the arrangement of the police station portion, especially the cells, and few dealt with the latter in a satisfactory manner.

The selected design (Messrs. Taylor & Simister) is undoubtedly the best submitted. In the basement are placed the borough treasurer's strong rooms, the overseers' book store, a staff mess room, meter room, and caretaker's room. On the ground floor are the cash receiving and rental rooms with cashier's office and rate-collector's office. On the first floor is the borough treasurer's department, the surveyor's department, and the overseers' department. On the second floor is an audit room, staff mess room, staff lavatory, and a caretaker's room; on this floor also is provided two general offices in connection with the town clerk's department.

Considering the difficulties of the site the plan is well conceived, and has the principal entrance from Frith Street to the cash receiving and rental rooms and to the rates office. The first-mentioned room is provided with an additional entrance from Greaves Street and an exit to Mill Street for use on special occasions. The approach for the prison van is from Greaves Street direct into the parade room, and has the exit at the opposite end into Mill Street. The cells are well arranged, and the cell corridors are entered direct from the parade room.

On the first and second floors the arrangement consists of a centre corridor with rooms on both sides. A door leading from the private portion of the inquiry space of the borough treasurer's department to the borough treasurer's private room might be advantageous. To what extent the staff rooms are proposed to be used is difficult to define, as no kitchen arrangement is provided for either.

The elevations of the present portion of the building are in a severe Classic style; the new portion, though freer in treatment, will harmonise well, and is illustrated by a perspective in monotint.

The second premiated design (Messrs. Winder & Taylor) has the cash receiving office abutting to Frith Street with the entrances direct. The arrangement of the special entrance and exit is not good and would lead to draughts on the days when the doors were in use. The positions of the magistrates' room and the magistrates' clerk's room are not satisfactory, as it would necessitate the magistrates passing along a public corridor to the bench.

The elevations are treated in a more severe manner than those of the first premiated.

The third premiated design (Messrs. Jenkins, Matley & Mills) has the cash receiving and rental offices placed parallel to Greaves Street. An objectionable feature is the number of folding gates to be opened to admit the entrance of the prison van to, and the exit from, the yard, there being no less than four pairs. The first floor is somewhat disconnected, and through communication can only be got by passing through offices. The approach to the magistrates' clerk's room is also bad, being either through the magistrates' room or the witnesses' room. The elevations are severely treated.

Design A (Mr. H. Cheetham) has the various departments more separated, and the long van approach from Frith Street to the prisoners' yard is not a desirable feature. The elevations can hardly be considered to be in keeping with the present building.

Design B (Mr. H. M. Johnson) has a disjointed appearance. The corridors are too narrow; the elevations are well finished, and would group up well with the existing buildings.

Design C (Mr. Thos. J. Hill) has a plan with a feeling of directness. The prison-van entrance is not good, being from Mill Street only, which street is very narrow. Only one exercise ground is provided, and the cells are on two floors, not a good arrangement. The treasurer's general office is narrow. The elevations have been designed in harmony with the existing buildings.

Design E (Messrs. J. Stott & Sons) also has the van entrance from Mill Street and the cells placed on two floors; the distance between the charge room and the cells being considerable is not good. The first and second floors are well arranged, and the elevations follow in outline and detail the present building, with the façade with one unbroken face, which tends to give the observer the impression of a commercial building rather than a town hall.

Design F (Mr. F. Wild) has the prison-van entrance from Mill Street, and male prisoners would approach the cells through a portion of the females' corridor. The corridors as shown by the plans would be somewhat dark.

Design G (Messrs. Matley, Davies & Baker) is fairly good in general conception, but the separation of the units of the borough surveyor's department is not desirable, nor is the arrangement of following the line of Frith Street and thereby throwing the rooms at that end of the site out of square. The rental office is bad in proportion, being 70 feet long and only 17 feet wide.

Design I (Mr. Thos. Hilton) has a fairly well-conceived plan, but here again the approach to the female cells is not direct, and the prisoners must either go through the male cells' corridor or round through the parade room. The tower would be a costly feature for the position shown.

Design J (Messrs. J. Collins & Son) has the van entrance also from Mill Street. The corridors are narrow, and the lighting of the court room would be interfered with. The elevations group up well with the present buildings.

Design K (Messrs. Heywood & Ogden) has many points to commend it. In endeavouring to make a satisfactory arrangement of the old and the new portions the authors have exceeded the instructions laid down in the conditions by designing a new council chamber and new court room, with the result that they have been disqualified. We noticed an undesirable arrangement in the public staircases in the form of winders.

Design L (Mr. C. J. Taylor) has the van entrance from Mill Street. The supplementary entrance and exit to the cash-paying office would create draughts when in use, and the lighting of the court would be interfered with by the close proximity of the new buildings.

Design M (Mr. F. Sharp) has the van entrance from Mill Street and the cells placed on a floor below the level of the van yard. The entrance hall to the cash-receiving office appears wasteful, the corridors are narrow, and the magistrates' room is too far away from the bench.

Design N (Mr. Sidney Stott) has the van entrance from Mill Street. The corridors are narrow and the lighting of the court would be interfered with. The position of the cash-receiving office is bad, being placed on the first floor.

Design P (Mr. C. J. Taylor) is practically an alternative to his scheme L, and has similar faults with regard to the van entrance and narrow corridors.

Design Q (Mr. Frank Herne). We notice some of the cells are placed under the building above, with windows in the archway; and the scheme suffers through a lack of knowledge of the subject.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

In our issue of last week we gave the abstract of a paper read before the Royal Institute by Mr. A. A. Hudson on March 14, dealing with "The Business Side of Architecture." The main point emphasised by Mr. Hudson was the necessity of making the training offered in every architectural school of a highly practical nature. Under existing conditions he believed that the art side of the education was allowed to overshadow all else. Mr. Hudson discussed the many pitfalls which awaited the young architect who commenced practice with little or no familiarity with business matters. An interesting discussion followed, and this is reported below:—

Mr. E. T. Hall proposed a vote of thanks to Mr. Hudson for his great kindness in coming to read such an interesting and valuable paper. In addition to his eminent qualities as a barrister, Mr. Hudson possessed some of the judicial qualities as being one of the members of the Tribunal of Appeal. The paper had dealt very fairly with the many shortcomings of architects and had pointed out considerations of great value in the education of students. Of course, the art side of the profession was the one that had the greatest fascination for them all, but the practical side was extremely important. There were multifarious duties to perform towards clients; and these, though they might not be always pleasing, were at least interesting, because interest would always result from a determined attempt to master a difficult and troublesome subject. One of the many excellent points which Mr. Hudson had brought out was the necessity for students to be trained in the writing of specifications and the preparation of quantities. The student in studying quantities was doing a most useful work even though he may never practise as a quantity surveyor. Mr. Hall said in his own young days he had made a practice of studying them, and it had since proved of inestimable value to him both in the disposition of many features in the design and in the consideration of the client's pocket. Many architects seemed to think that the writing of a specification was a laborious and quite unessential undertaking. But it was, nevertheless, one strongly to be recommended, for it teaches the architect really to know about his building, more perhaps than the clerk of works or even the contractor, and it will enable him to come to a decision quickly. Yet another point about it was that the writing of specifications fostered a certain amount of literary style, for the writer had to express himself clearly and tersely. The question of cost to which Mr. Hudson had alluded was an important matter, so that the study and knowledge of the cost of a building is of very great value. The foresight requisite for the proper specifying of the materials and the various works to be carried out was only to be gained by an architect writing his specifications and training his mind to imagine all the difficulties which may later be met with. If this is done the client will be saved from the payment of large bills at the end. With regard to planning, it was now usual for the planning of the exterior to proceed *pari passu* with that of the interior. The custom prevalent thirty or thirty-five years ago of first getting a fine exterior and then fitting the interior to it as well as might be had fortunately died out. Mr. Hudson said that the result of the existing art education had been to produce a race of young draughtsmen of great ability, rather than a set of practical men. It was undeniably true that though draughtsmanship was good it was not architecture. An examination of the drawings made by the architect of York Gate showed that he would have been plucked at any architectural school examination. There seemed to be a great tendency at the present day to make draughtsmanship too prominent. The paper alluded to a house set on a hill top which had bedroom windows the whole width of the room. There was this much to be said in favour of too much window, that the sun which it admits is a germ destroyer, and the room would be, at any rate, a healthy one even though cold. Mr. Hudson had emphasised the necessity for an architect to act with the greatest fairness between the builder and the building owner, in view of the judicial or quasi judicial position in which he is placed under the contract. The architect who boasts that he is the master on his work and that he keeps the builder under his thumb i making a wild boast; rather he should boast that the builde is his friend and that the workmen are endeavouring to d what he wants. If the architect sets the builder at loggerheads he will never get good work out of him. One of the pitfalls that beset the architect's path is in connection wit supervision—a matter about which he is often not very clear It is iniquitous that he should be held responsible for wha he could not be expected to have seen. An architect canno spend the whole twenty-four hours on a job, and yet he i made accountable for what has been done in his absence Architects sometimes also get into trouble because they fai to keep their client regularly and quickly informed of th variations that are necessary in the building while in cours of erection. They should bear in mind that it is quit questionable how far any variation can be made without th client's knowledge unless the architect is willing to be hel responsible. Mr. Hudson was very wise in advising then to act in accordance with their conditions of contract; thi was only too frequently not done. Architects appear t imagine that they can work their own sweet will in everything, though this is far from the real experience of most The provision in the R.I.B.A. arbitration clause, that arbitration should not take place until after the completion o the works, was inserted as a check on any litigious contractor who could otherwise break the heart of an architect b constant recourse to arbitration. Mr. Hudson had take great exception to it; but in actual practice the clause i often ignored, as a reasonable architect and contractor wil hold necessary arbitration in the middle of the job whe that seems to be the desirable course. The conditions issue by the R.I.B.A. were the result of a very great fight betwee architects and the builders, and they were therefore more o less of a compromise. Mr. Hudson's advice that an arbitrator should at an early stage of the proceedings ask for cheque, or an undertaking from the solicitors to take up hi award and pay his fees was a most proper one. The neglec to do this often places the arbitrator in a most unsatisfa tory position. The suggestion made as to possibility of certain standardisation was fraught with the utmost diff culty; it was far easier to standardise engineering tha architectural work.

Mr. John Slater, in seconding the vote of thanks, sai that it was a great pleasure to have Mr. Hudson among the that evening. What he did not know about the busine difficulties that beset an architect was certainly not wort knowing. But after hearing the somewhat disparaging comparisons made in the paper between the present system architectural education and the old-fashioned pupilage it was impossible to help thinking that the lapse of twenty-five or thirty years had thrown a certain amount of glamour over Mr. Hudson's recollections of his young days. According to the experience of most people the average youth in an office did not, as a pupil, get very much instruction. They were certainly told to trace things and so on, but the instruction was not of a kind that went very far towards training them for the practical work of their after-life. Mr. Hudson had said that the scheme prepared by the Board of Education gave the idea that the young architect was compelled to study architecture as an art. But, as a matter of fact, the Board felt that practical work was the main thing. Mr. Hudson had also commented on the arrangement in the evening classes at the Architectural Association School whereby business matters are reserved for the fourth and final years, and then ten lectures are devoted to as many different subjects. But it might be asked whether such matters as dilapidations, light and air, contracts and agreements, specifications, and so on, could be taught in a school. As for the London Building Act, they had been practising under it for years and years, and had not learnt it yet. Indeed, with many of the matters that Mr. Hudson appeared to think should be taught in the school it was doubtful whether they could be satisfactorily learnt in that way at all. For instance, was it possible to teach a young student the various data and facts that relate to an arbitrator's work? The probability is that before he becomes an arbitrator the young architect will have gained experience in giving evidence in such cases. An architect should no doubt know all about such things, but there were very great difficulties, if not impossibilities, in trying to teach him all these things in the school. Mr. Slater said that long ago he had been told by a Q.C., as a piece of advice, that more cases were lost by trying to make them better than they were than by any other way. This had proved to be quite true. The only advice that he would venture to give was that the young arbitrator should not be cajoled into explaining his reasons for any decision come to. He could quite endorse the advice that an architect should make up his mind quickly whether work carried out by the contractor was to his approval or not; it was a very bad thing for the architect to say that he would give his decision later.

Mr. W. Woodward said that he must disagree with Mr. Hudson's suggestion of standardisation. As to arbitrations he hoped that clause 16 which gave the architect absolute power as to materials and workmanship would be modified. He had a case before him at the present time in which he felt convinced that the architect had rejected certain materials owing to lack of knowledge, for they were of the best quality possible. There ought to be a guard against a decision of that sort. He would like to warn every young architect that sub-contractors are a pit-fall which should be avoided, for he had found that the fewer sub-contractors there were on the job the better. They were a nuisance to the builder, and ultimately became a nuisance to the architect. The builder ought to be given greater control than at present. It was perfectly true, as Mr. Hall had said, that a knowledge of quantities and the leading prices would prove of the utmost value to the young architect; if he was an art architect he would not find the knowledge interfered with his art instincts, but he would find that he was a master of the building when he gets on his job. Mr. Woodward recommended every student to read carefully the list of points prepared by Mr. Hudson on which litigation might arise, for they included all the causes he should keep prominently under his consideration. Particular attention should be paid to the risks incurred in unauthorised alterations and additions, for it was so easy to allow addition after addition to run on without telling the client until the inevitable quarrel had occurred. In concluding, Mr. Woodward said that the paper was brimming over with information. It came from one who had been an architect and who was at the present time a very successful lawyer.

Mr. W. H. Atkin Berry said that the paper and its subsequent discussion reminded him of a discussion many years ago in that room as to whether the art side or the business side of architecture should receive the greatest consideration. Professor Aitchison had then said that if he wanted to select a baker he did not ask him if he knew the ancient history of the trade, but he asked him, "Can you bake bread?" Professor Aitchison believed that we may easily waste too much time in discussing historical questions; what he would ask a young architect was, "Do you know your business?" Mr. Hudson had spoken in his paper of "the desirability of putting the specification for the ordinary requirement of every-day practice into standard form." The proposal was a rather alarming one, for it threatened to crush out all individuality and leave nothing for the architect to do except to become a sort of architectural sausage-machine, out of which a building would come to the entire dissatisfaction of everybody.

Mr. H. P. G. Maule said that for seven years he had had control of the Architectural Association Day School. In that course of time two things had been most particularly borne in upon him. The first was the immense scope of an architect's calling and the amount of things he has to know; while the second was the danger of overcrowding the curriculum and giving the student not education but confusion. There were two ways of looking at education: one was to regard it as a sort of cramming-box, and the other was to try, in the very limited time, to train the student in principles so that he may apply in detail his own knowledge. Mr. Hudson had alluded to the fact that there was only one lecture given up to the London Building Act; it was never claimed that a single lecture would make a student proficient in the Act, but it might indicate to him the principles underlying the Act and enable him to tackle later its difficulties. So far from putting such things in the curriculum it seemed to him to be shown that they ought to be kept out. Ninety-nine per cent. of the A.A. students went into an office as pupils at the end of their two years, and their training was not ended at four years. Mr. Hudson had apparently written his paper from a study of the curriculum and not from a study of the actual work done in the School. A great deal was talked and thought about the education of the young architect, but comparatively few people had had to do with the handling of students. The more one has to do with them the more one feels how dangerous it is to go fast. In the school the pupils were trained in writing about the work they were doing and about the visits paid to various buildings. In his opinion, if a student had a fairly solid knowledge of his materials and of the workmanship he will find little difficulty in writing his specification. There were various other points raised by Mr. Hudson which he would hardly have made if he had had more first hand knowledge. The paper certainly showed that architects should not be content with a slight education. It was impossible for a student to cover all the ground he will meet with when he gets into practice, so that it would be an advantage if he had some further opportunity of acquiring knowledge.

Mr. Max Clarke said he would like to support the proposal as to standardisation. It had been stated in the discussion that bricks cannot be standardised; but they had not learnt that architects take the trouble that the various kinds of brick should work in together. The Science Committee were at the present time engaged in trying to get information with regard to the standardisation of paints; and they had arrived at a state of unutterable confusion. It was known that 50 per cent. of the material is not paint at all. Mr. Max Clarke said that he had brought before the Science Committee a specification of timber; 50 per cent. of the present day specifications are of timber that cannot be got. It would be an excellent thing to put, not only before students, but before the members of the Institute also, a description of materials that cannot be got in this country. The specifications in use contain clauses which are copied from generation to generation and include things that are not now obtainable. The same kind of thing occurs in plasterers' work.

Mr. Hudson, in acknowledging the vote of thanks, which had been carried by acclamation, replied to the various points raised by the speakers. With regard to the School, he thought the teaching should be on the basis of the architect asking himself, "How is the thing to be described and what will it cost?" There ought to be no tendency towards making pretty drawings. Mr. Hudson said that as he walked down a street and saw the buildings he often remarked to himself, "That was a pretty drawing, but it is a wretched bad building." The architect should see the building in its very worst light and not in its very best on paper. He was still of opinion that it was quite possible to make the work a great deal more practical. With regard to his proposal of standardisation, he would only say that there was the greatest difficulty in getting any one clause of the specification written correctly. It would be of the greatest value to architects if they had every description of wrought masonry put on paper correctly, for there was more litigation about masonry than anything else. Mr. Hudson concluded by saying that his only desire was that the profession of an architect should advance by great strides.

## CHURCHES AND CLOISTERS IN PORTUGAL.*

*(Continued from last week.)*

### *Batalha.*

BETWEEN Alcobaça and Batalha is the meagre little village of Aljubarotto, in the vicinity of which took place on August 14, 1385, the great battle which secured the independence of Portugal for about two centuries. In passing through the village I noticed a mutilated pillar or cross, close to the quaint tower of the humble village church, a great contrast to the magnificent Dominican abbey church erected in commemoration of the battle of Aljubarotto some nine or ten miles away at a place then called Pinhal, but now Batalha or "Battle."

BATALHA ABBEY—FROM SOUTH-EAST.

As already stated, the victor in this battle, King John I., soon after it married an English princess, Philippa, daughter of John of Gaunt, and therefore grand-daughter of the English King Edward III. The abbey was started in 1387 or 1388, and possibly to this English union may be attributed some of the features we see in its architecture. For instance, unlike Alcobaça (so much earlier in date) and Belem (so much later), we have the clerestory, as in England, but no triforium, as the roofs are practically flat and covered with stone slabs on top of the vaulting. There are no western or central towers. There is a small bell tower in an unusual position, rising from a thick wall north of and continuous with the western wall of the north transept.

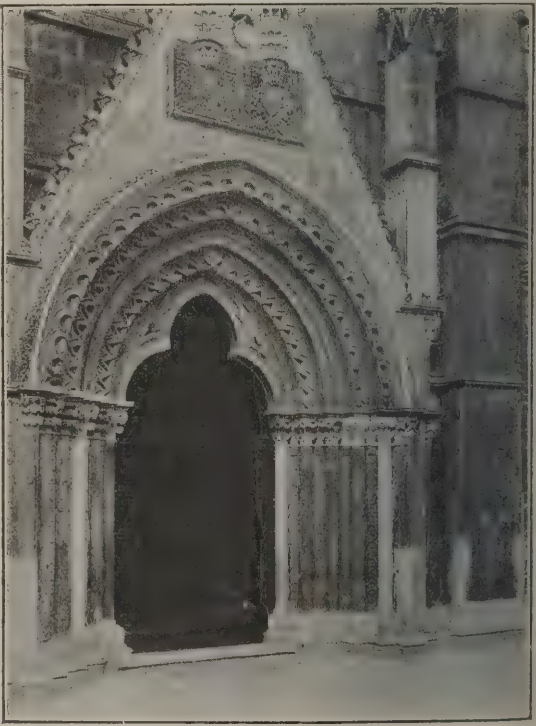
At the south-west corner of the nave is the large Founders' chapel, which we will come to later.

The whole of the buildings are constructed of a beautiful fine limestone, like that of the tombs of Pedro and Inez at Alcobaça, which acquires a beautiful old ivory tint by exposure, except where damp and in the shade, when it goes nearly black; hence the weather stains on the north side of the church are very marked in vertical lines.

Just as we arrived at Batalha a heavy rain shower of about ten minutes' duration had just ceased, and the sun shone brightly. The effect was marvellous. The atmosphere was brilliantly clear, the gargoyles were spouting forth jets of water from the flat roofs, a film of water was still standing on the paved courtyards to the west and south of the church and reflected its architecture and the blue sky above with a fairy-like effect.

The total length from east to west, including the remarkable unfinished chapels at the east end, is 416 feet, but the church proper is not really large, its internal length being 260 feet. It consists of a nave of eight bays 27 feet wide by 90 feet high, with north and south aisles measuring 72 feet from north to south. The transept is 121 feet long without aisles; there is a short choir and central apse to the east, and on each side of this two apsidal chapels about half the height of the choir and central apse. There are fine ranges of aisle and clerestory windows.

The church, so far, was finished in 1415, when the queen died and was for the time being interred in front of the high altar. The king then set to work to build the large "Founders' chapel," already referred to, at the south-west corner of the nave, to receive her remains and his own. This was finished about 1433, when the king died, and he and his wife were buried in it. The chapel is square on plan, 82 feet over all each way (internally 66 feet square), with a central octagon 40 feet over all diameter, which rises up above the flat roof of the square, and is said to have been surmounted by a spire or octagon roof of open-work tracery which was destroyed by the earthquake of 1755.



BATALHA—SOUTH DOOR.

In the centre is the tomb of the king and his wife Philippa, with Latin epitaphs of portentous length, their effigies on top, side by side, with their right hands clasped together. One feels it was a scene like this that inspired Matthew Arnold's beautiful lines in his "Church o Brou," "So rest, for ever rest, O princely pair"—too long to quote here, but which must appeal to every architect on account of their exquisite word-painting of an architectura interior. In recesses of the south wall are the tombs of thei sons, Pedro, Henry (the Navigator), John and Fernando (o these only Henry's has an effigy, and his tomb displays the English Garter). The eldest son and successor, King Duarte (*i.e.* Edward), and his queen lie in front of the high altar, their effigies also having clasped hands. This king only lived five years after his accession, but he commenced the most remarkable feature of the abbey called the "Capella Imperfeita," or unfinished chapel, which stands at the extreme east end with a central octagon 65 feet in clear diameter surrounded by seven apsidal chapels 25 feet deep, one on every side of the octagon except the west, and between these chapels little low chambers intended to be the actual resting-places of those members of the Royal family who were expected to lie there.

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* A paper read before the Northern Architectural Association, on March 2, by Mr. Joseph Oswald, F.R.I.B.A.

BATALHA—PORTAL IN CAPELLA IMPERFEITA.

BATALHA—WEST DOOR.

*(To be concluded.)*

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### VI.—THE REFRIGERATING MACHINE (*continued*).

*(Continued from last week.)*

THE difference lies in the machine itself. In designing this we are still faced with the same problem; a low pressure must be produced in the evaporating coils to bring about evaporation and consequent absorption of latent heat; and a high pressure must be maintained in the condenser to cause, with the aid of the cooling water, liquefaction of the refrigerant. The problem, in vapour compression machines, is solved, as we know, by using a mechanical compressor. But in absorption plants, owing to a peculiar property possessed by ammonia, this appliance is eliminated. The property referred to is the powerful affinity existing between ammonia and water, which, as is well known, will dissolve more of this gas than of any other, and its application will be seen by considering the diagram given in fig. 19.

This shows the five principal elements of the machine, namely, the generator, condenser, evaporator, absorber, and circulating pump. We are already familiar with the evaporator and with this we have nothing further to do. Tracing out the rest of the cycle, we may start from the generator, which consists of a vessel, wherein strong ammoniacal liquor (*i.e.*, a strong solution of ammonia in water) is heated by means of steam. The effect is to drive off the ammonia as a gas and to force it in the direction of the arrow into the condenser. This is separated from the evaporator by an ordinary expansion valve, which, if closed, will cause the pressure of the ammonia vapour to accumulate until, with the aid of the cooling water it is sufficient to bring about its own liquefaction. The liquid is then allowed, by slightly opening the expansion valve, slowly to escape into the evaporator, where it is vaporised and absorbs heat from its surroundings in the usual way. The vapour passes next into the absorber, into which at the same time the weakened liquor from the generator flows at a definite rate through the regulating valve shown. The absorber is kept cool by circulating water, and the weakened liquor by reason of its strong affinity absorbs the gas coming from the evaporator, thus forming once more a strong solution which the circulating pump forces back into the generator. The cycle then starts afresh.

This is the crude form of the cycle, and, if the machines were carried out exactly on these lines, there would be two important sources of loss. To avoid these two refinements have been introduced involving two extra pieces of apparatus. Firstly, the weak liquor coming from the generator is naturally at a high temperature, and, for economical working, must be cooled down before being allowed to enter the absorber. This is accomplished by means of a heat exchanger, through which the weak liquor flows in one direction, and the strong liquor, coming from the circulating pump to the generator, in the other. The result is that the cold strong liquor is heated and the hot weak liquor cooled, a mutual benefit being effected. Secondly, the heat acting on the strong liquor in the generator always drives off a certain amount of water vapour together with the pure ammonia. The vapour is therefore passed through an analyser and rectifier, into which the strong liquor coming from the absorber is sent, after leaving the heat exchanger. The effect is to separate out the water vapour from the ammonia and give it to the strong liquor, leaving the anhydrous gas (*i.e.*, gas freed from water) to enter the condenser. The strong liquor then goes on to the generator, having passed through, on its way from the circulating pump, two pieces of apparatus—the heat exchanger and the analyser. Yet another economy may be effected by allowing the steam cylinder which drives the pump to exhaust into the generator, thus utilising the waste heat of the steam.

Fig. 20 illustrates a practical form of the machine, as made by Messrs. Ransomes & Rapier, Ltd. The long cylindrical vessel on the right is the generator, on top of which is mounted the ammonia circulating pump, consisting of the pump proper and a direct driving steam cylinder. The four vessels on the left, reading from bottom to top, are respectively the condenser, absorber, exchanger, and rectifier, and the remaining element—the evaporator—is not shown. This may be made in the form of an insulated brine tank, as previously described, or it may consist of direct expansion piping, located in a cold store, ice making tank, or other position, according to the purpose in view.

The advantage of these plants is that there are very few moving parts, the compressor, which is necessary in the vapour compression machine, being replaced by the small liquid circulating pump. Minor expenses, such as packing renewals, lubricating oil, &c., are, therefore, saved, and the number of wearing parts is reduced to a minimum. Against this, however, must be set the complicated pipe connections and general intricacy of the machine. These render it quite unsuitable for small plants, although in larger sizes it compares favourably with the compression machine, when driven by its own or separate steam engine.

Another disadvantage is the high water consumption. Exactly the same amount of water must circulate through the condenser as in the compression machine, but in addition we have to deal with the absorber. This must be kept cool, and, to counteract the tendency of the temperature to increase, on account of the dissolution of the ammonia, a continuous circulation of cooling water must be maintained. The water already used in the condenser might, of course, be afterwards sent through the absorber, but it is much better, for the efficiency of the machine, that a separate supply should be provided. Hence the total consumption is very large.

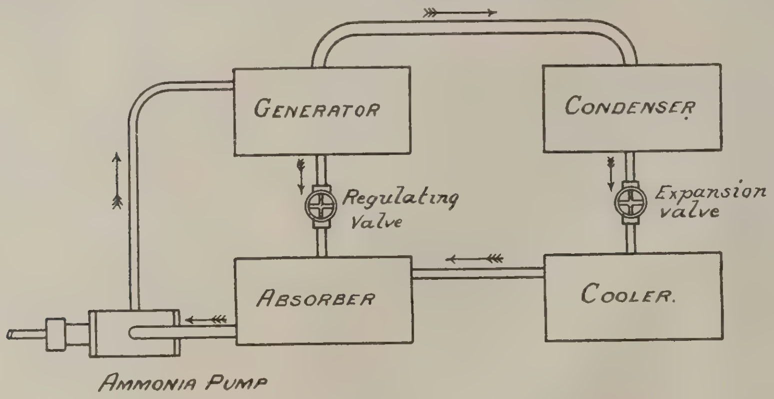


Fig. 19.

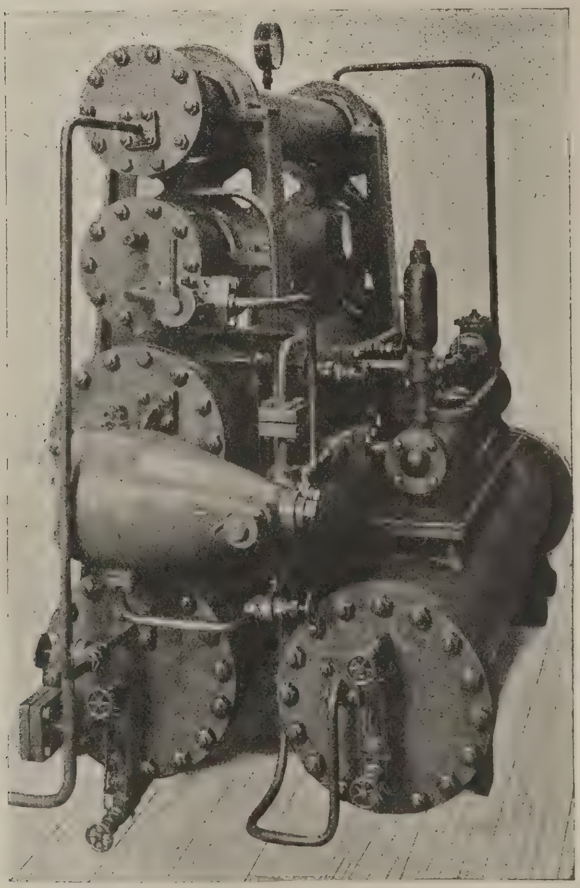


Fig. 20.

When working with steam specially generated, the absorption machine does not compare with compression plants for economy, especially if the latter are driven by gas engines operating on suction gas. But, where other steam plant is in use, a very considerable saving can be effected by running the exhaust from the various engines into the generator coils of the machine. Then, instead of the latent heat in the exhaust steam being wasted on the cooling water in the steam condenser, it is usefully employed in heating the ammonia liquor. The saving of fuel will in fact amount to some 40 per cent. when an absorption machine is used, in conjunction with compression plant already installed, although on the other hand the interest on the capital expended on extra plant has to be considered.

*Cold Air Expansion Machines.*

These machines were at one time used to quite a large extent at sea, as they work with ordinary atmospheric air, but at the present day they are practically out of date.

The air is sucked from the cold rooms into the compression cylinder of the machine, is there compressed, and afterwards deprived of its heat of compression in cooling coils. It then passes into the expansion cylinder, where it expands, doing useful work on the piston, and at the same time reducing its own temperature (heat being taken from the air and converted into work). In this state it is allowed to escape back to the cold room and effect the necessary cooling on the objects stored.

There is, therefore, a continuous circulation in the cold chambers, and there is no evil smelling gas to escape from the machine should a leakage occur. But, unfortunately, two cylinders are necessary—one for compression, and another for expansion—and this means a large increase in the loss by friction. In fact, even the best cold air machines absorb two to three times the horse-power taken by corresponding plants, using vapour compression. In addition to this the machine is very bulky, and minor troubles, such as the choking of the air passages with snow, &c., are found to occur.

*Water Evaporation Machines.*

These machines act on a principle somewhat similar to vapour compression. Water is evaporated at a reduced pressure caused partly by a pump and partly by absorption of the water vapour into concentrated sulphuric acid, and for continuous working an extra pump is provided in order to exchange the diluted acid with the concentrated. Machines of this type are now used only for domestic purposes and even then are very seldom found.

(*To be continued.*)

## ILLUSTRATIONS.

### CATHEDRAL SERIES, LLANDAFF.—THE SOUTH DOOR.

We this week complete our illustrations of Llandaff Cathedral, with a view of the South door and a measured drawing by Mr. W. Eaton of the West door.

### SKETCHES OF STAIRCASES.

The sheet of measured sketches of staircases by Mr W. Eaton are mostly of well-known examples, and at least speak for themselves.

### COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

The accommodation has been arranged for on four floors, with a basement below; good and well-lit corridors and a wide staircase with passenger lift opposite providing means of communication between the different departments. Externally the elevation to the Forbury has been treated in a dignified manner, ornament and sculpture being sparingly used; this front and the side and the back elevations depending upon good lines and proportion rather than elaboration for their effect. The offices of the clerk of the peace and one of the committee-rooms have been placed on the ground floor with direct access to the Assize Court hall by means of a wide corridor, with an inquiry office and committee-room near. The offices of the education secretary are on the first floor, together with the committee-room. The county surveyor is upon the second floor, care having been taken to give the drawing office and the assistant-surveyor a good north light. The county treasurer and the land steward are located on the third floor. The cost of the building (including 1,500*l.* for fitments and lift) was estimated at 15,850*l.* The design was prepared in competition by Messrs. Gibson & Robertson.

## PRE-HISTORIC POTTERY IN PERU.*

PRE-HISTORIC man and his methods of life may be best studied by his pottery: it is one of the earliest and simplest of crafts, for by means of baked clay, with his fingers and the most elementary tools of wood or stone, he could shape his cooking pots or gods, his jugs, bottles and urns, and these have as much interest to the archæologist and art student as nature's earthenware fossil plants, and those of animal life which are

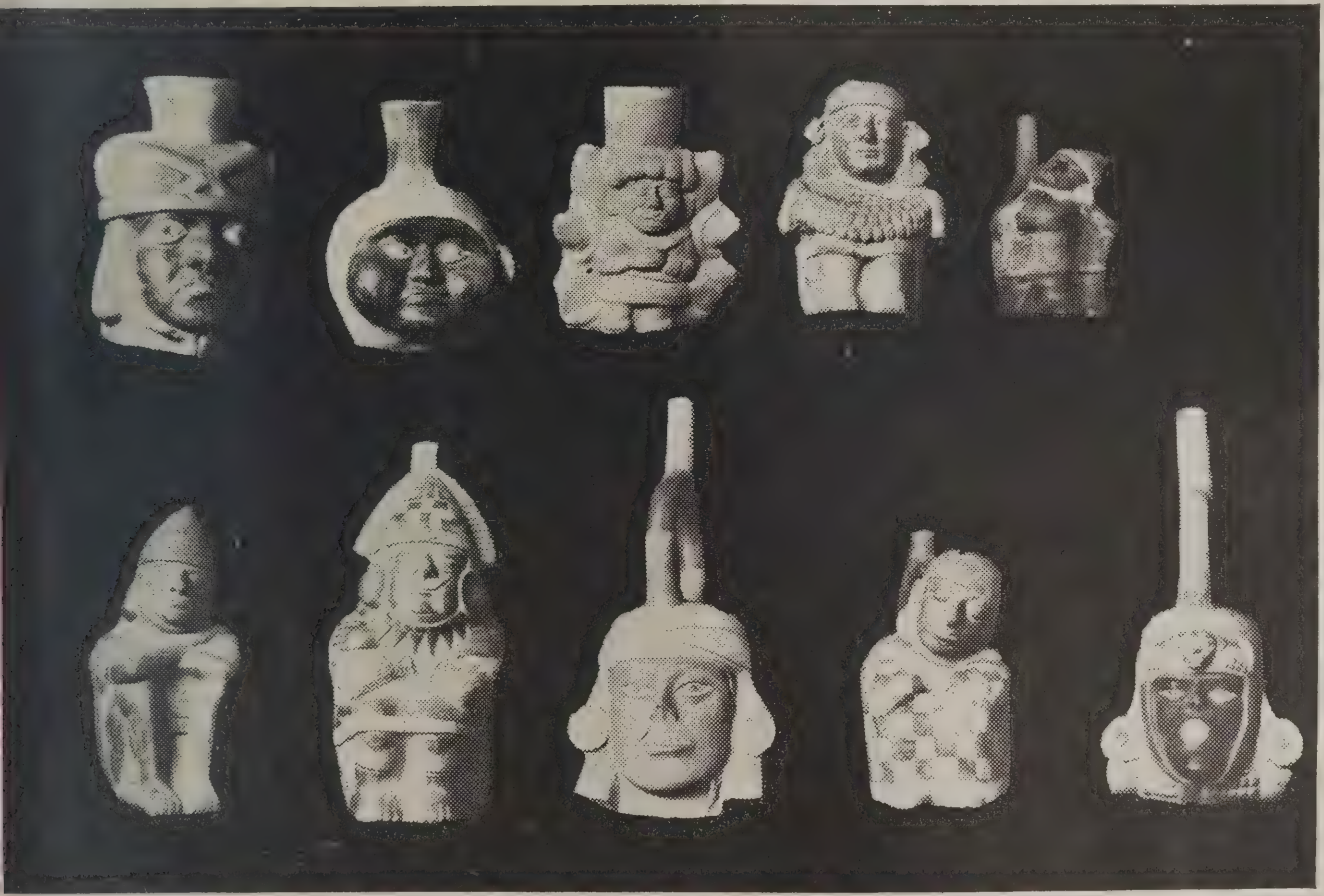
"In the ages lying
In the buried past of the earth"

have to the geologist and the students of botany of the ancient world.

I have seen the pottery discovered by Mr. Hewitt Myring and he has been good enough, at short notice, to lend me many photographs, some of which are here reproduced.

I hope that we may, before long, see some of his specimens in Manchester.

Mr. Myring is a mineralogist and mine owner, and while waiting for assistant engineers' reports, he, being in South America, visited the Chincuna Valley in Peru, and seeing some sand ridges there he obtained assistance and explored them with the view of finding something in the Inca graves; but the race before the Incas, the ancient people, the Chimus, had used this valley as a cemetery, and the result has been the discovery of many hundred pieces of probably the most ancient pottery in the world, the product of a lost civilisation, possibly 10,000 years old.



The pieces are in the best state of preservation, for there is no rain in Peru and the silicates in the earth have arrested decay; even metals thus buried oxidise very slowly.

The climate in the valleys of Peru is similar to that of Egypt and probably drier; it is an accepted fact that iron resists oxygen, except when damp; iron does not rust in dry oxygen; sycamore planks and cases in the Cairo Museum have no sign of decay although 4,000 years old; there is an arm-chair there nearly as good as new about 3,000 years old, which I saw the other day.

No alphabet has yet been discovered, no language has been found, and in the absence of proof opinions differ about the age of this pottery. Symbolism is the parent of the alphabet, and we owe much to China and Egypt for its elucidation; there it took thousands of years to blossom, and the supreme partnership between the tongue, the eye, the ear, and the hand at last gives us the written word that will in scorn of time for ever silently speak to man.

When the Spaniards destroyed the Inca civilisation and murdered their leaders, even then the native language was uncouth, and calculations and accounts were kept by knotted cords.

It is difficult for us to believe that these people, with their symbolism in this pottery, should have had no alphabet and no method of record. They must have had some, unknown at present, and that is the quest that should crown Mr. Myring's work, if his health permits; then we shall hail him as another Rawlinson, who discovered the key to unlock the doors of ancient Babylon.

When looking at the Peruvian pottery we cannot escape the feeling of Chinese and Indian influence, and then again in looking at the head-gear we feel an Egyptian bias; indeed, the Egyptian pottery of any dynasty except when under the influence of the Greeks, after clay from Europe had been used, is not equal to the best of these Peruvian specimens, for the modelling of the human face is human and startling in its art; there we find dignity and even laughter, the muscles of the cheeks, and the wrinkles in the skin, and the flexibility of the nostrils all show great care, skill and art.

The signs on some of the figures suggest Egyptian influence; it may be natural independent evolution, but it makes us wonder if Atlanta was not more than a dream of Plato's, when he wrote that beyond the pillars of Hercules (Gibraltar) there was a large island in the sea.

Peruvian and Mexican art bear traces of evolution and progress almost identical with early Egyptian work, but stopped half-way.

Professor Zerffi, in "The Historical Development of Art," says:—

"By some means Atlanta was separated from the East, and the pyramids, temples and palaces of Central America remained in the same relation to the pyramids, temples and palaces of Egypt as the tapir to the elephant, the alligator to the crocodile, and the llama to the camel."

One of the gods discovered in Peru, notably one carved from a lava block, has a head strip like a sphinx and is also like the goddess Isis. The word God is similar in the west to the Deus of the east, for in Peru it is Teotl. Sepulchral mounds are similar. Astronomy had made similar progress in both places.

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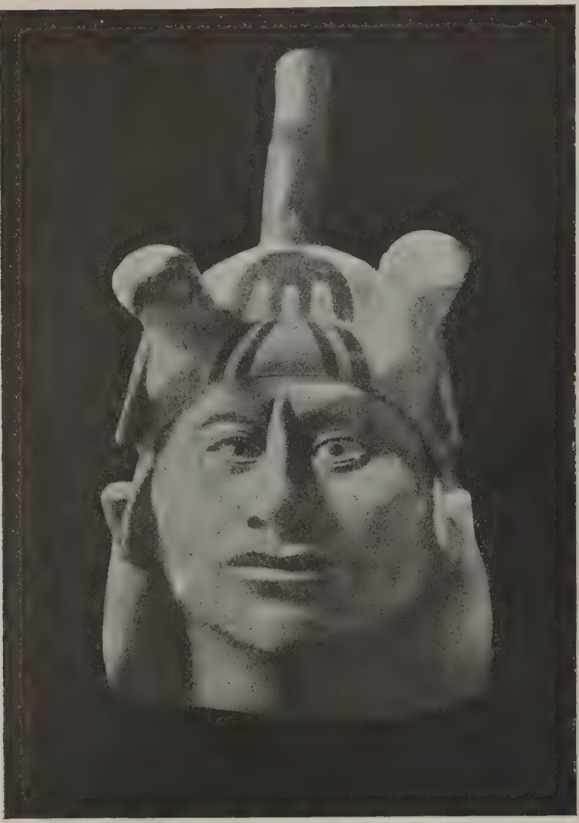
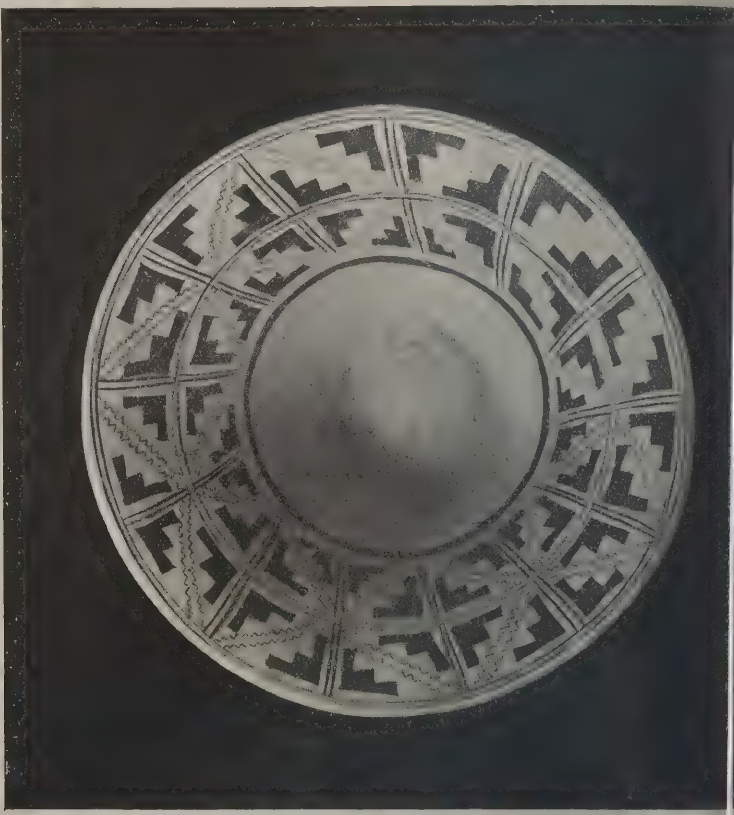
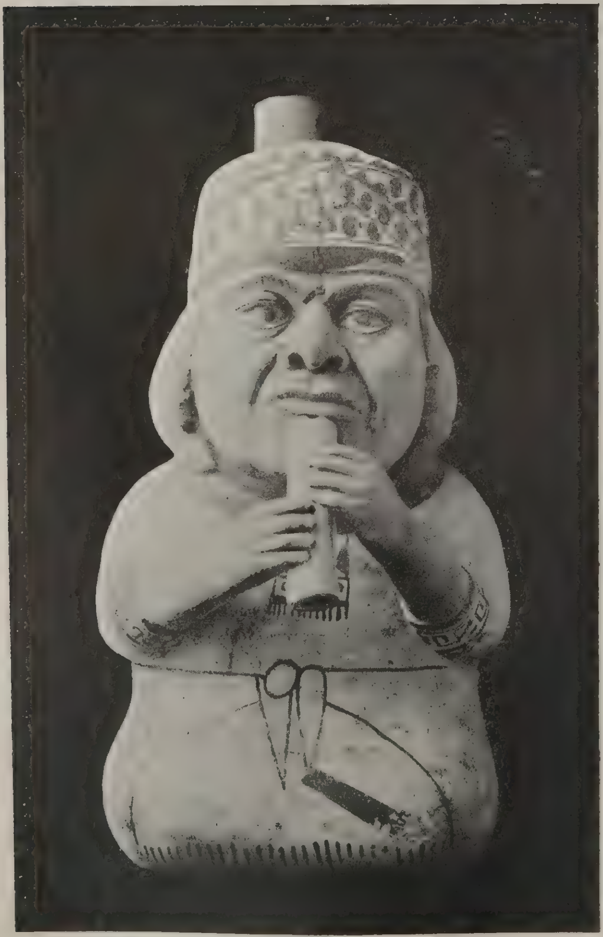
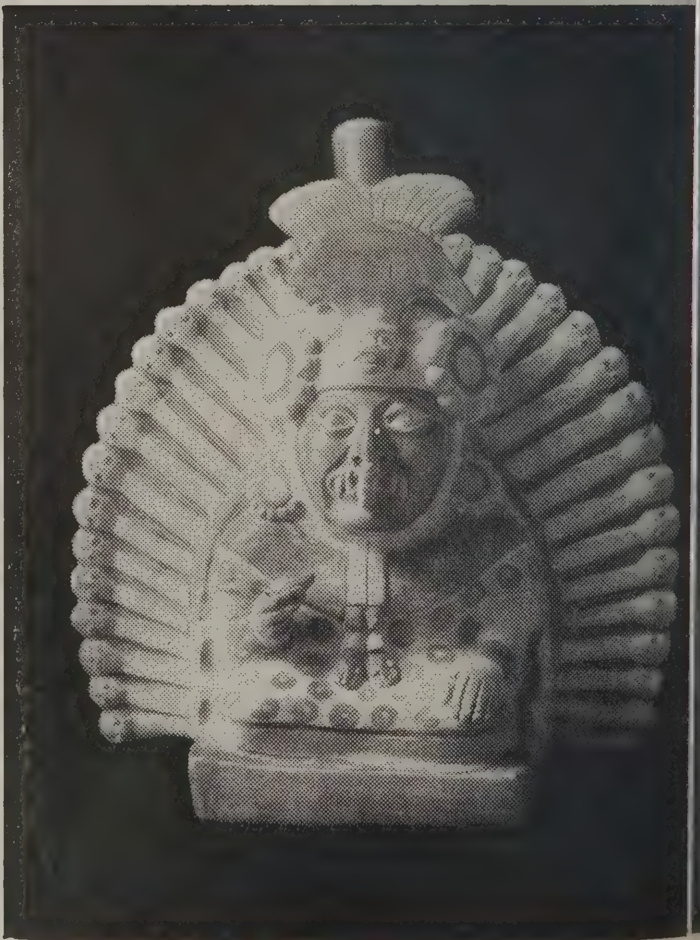
* A paper on Mr. Hewitt Myring's discoveries, read by Sir William H. Bailey before the Manchester Literary and Philosophical Society on March 8.

As I have said, wood and clay were shaped by primitive man before he began to use iron or bronze; pottery is the easiest, for few tools are required; those who could mould and shape clay were in the right way to make bronze statuary. The artists of Samos were the first to run metal round a clay model, probably about 600 years before our era; but it may have been anticipated by the Chinese, as









they were far in advance of the Greeks and probably the Egyptians in pottery, and are yet; but the bronze age follows that of the clay if the right metal is available.

This pottery discovered by Mr. Myring has one remarkable, one important, quality—no two pieces are alike. We thus see that the ancient moulders had made one great step in human progress, for they did not copy each other. There is individuality in each figure; the serfdom of habit and custom and tradition did not govern their work; such workers must have had intellectual liberty and original genius, which might have made a great future, but from some unknown cause that progress seems to have been destroyed, and left little trace behind.

There are several hundred examples of this Peruvian pottery brought over to this country by Mr. Myring.

About one-third of those discovered have been secured for the British Museum, and may be seen any day in the cases in the porcelain rooms.

The Sun God is in Mr. Myring's private collection, and it will be seen that the figure has a helmet and a number of serpents with their heads at the outside edge of the nimbus.

These pots were buried with the dead, and like wreaths at our funerals are supposed to be evidences of love and respect of friends and relations.

They vary in shape and size; some are portraits, some are animals, birds and fishes; the turtle, the owl, and men and women are here; some laugh and others are full of dignity; one is the face of a man winking with one eye; one face is asleep, it may be the sleeping sickness; others show signs of misfortune, of disease—it has been surmised that such indicate the cause of death; others seem to provide for the comfort of the departed in the spirit world, some for food, others for water; others have gold and silver pellets, probably for fare money at the ferry. No stamped coinage has been found. The gold and silver is hermetically sealed on the false bottom of the jugs and vases, for the bottoms have been baked into position.

Some jugs have a whistle in the spout, pandean pipes are represented, and one is the figure of a man playing a flute, and bugle horns made of terra-cotta that make a pleasant sound. One figure shows a man with cymbals.

Weapons are not much in evidence, one man has a mace and the spear and shield seem to be the only weapons. Neither bows nor arrows have been discovered. No horses are to be found; there is a beast like a hornless antelope; birds are somewhat abundant, several owls and a bat-like beast, and stags and frogs are imitated. The bugles end with a dog's head; there is a walrus, and something like a Welsh heraldic lion is biting a man. Parrots are represented and also ducks and fish are here. One specimen of the finest is a learned doctor with a plumed head dress, one—probably the finest—believed to represent a Chimu chief or a wealthy law giver; one represents a seal eating a fish, and known and unknown effigies of the animal kingdom are in this collection.

The faces represented are doubtless portraits, and look English or German; some would be taken as easy going Dutchmen sitting in the market place at Haarlem, waiting for custom, broad faces and intellectual, and the workmanship equal to any of the portrait jugs in vogue in this country in the eighteenth century, and in some cases better art; the vases and dishes are beautiful specimens of ancient ware.

We can only guess at their meaning; some are painted as well as moulded but all scarcely bear any indication of what we call the hand of time.

The bars of silver that were buried with this pottery have oxidised nearly away; some bars that were about an inch square have dwindled down to about one-eighth of an inch. Comparisons have been made with the oxidation of silver buried 400 years ago by the Incas in the same soil, which being so full of silicates preserves metal; the silver is only slightly tarnished. This and the utter disappearance of the baser metals give reasons for assuming the age of the pottery to be anything between 5,000 and 10,000 years old.

Mr. Myring has also discovered more modern Peruvian antiquities, a large silver god and a gold crown of one of the Inca kings and some jewellery.

All archæologists and students of art and antiquity are indebted to Mr. Hewitt Myring for his great and priceless work in Peru. Single-handed, at great personal danger and cost, he has contributed to our knowledge of ancient man and a buried civilisation, and earned our gratitude, and also made a reputation which will cause his name to rank in history with those of Layard, Rawlinson, Loftus, Professor Flinders Petrie, and other illustrious explorers.

## THE SOCIETY OF ARCHITECTS.

A LECTURE, entitled "The Art of the Plasterer," was delivered before the Society of Architects on Thursday, March 10, by Mr. Geo. P. Bankart.

The lecturer said that when Mr. Butler had written to him, asking if he would give a paper on the subject of plasterwork, he (the lecturer) had replied asking which side of the subject he would like, whether the historical, technical, or modern side. The reply, which Mr. Bankart said had placed him rather in a quandary, was that it would be very nice if he could combine the three. The subject was too large to take in all of its branches. He was, however, not going to give a formal paper, but a selection of slides and a general chat.

Continuing, Mr. Bankart said:—The chief point I want to drive home is this, that in whatever age the "art of the plasterer" was practised the greatest result was attained by the proper development of the different kinds of material that were used. That is the chief point I want you to bear in mind right the way through viewing the slides.

The immense variety that took place in the modelling and handling of the decorative work was due almost entirely to the difference in the nature of the plaster that was used;

and, historically, I want to classify these plasters into four distinct headings. First of all the "Stucco-duro" of the Italians (or carbonate of lime), that is to say, it was the "limestone" of the hills, which was thoroughly well burnt and slaked for a large number of years, thoroughly thumped and knocked about, and so toughened in that way that it became very flexible and very malleable; so malleable, in fact, that the die-sinkers used it in preference to wax for die-sinking.

The next division is the "Pargework," that is to say, the ordinary lime sand plaster that was used (and that we know) for parging flues, differing from the ordinary lime-plaster in that it contained road scrapings, cow-dung, and ox-hair. Then we have the third division, the "Plaster of Paris," which was introduced into this country in Henry the Seventh's reign, although in general it was not much used until Elizabeth's. Then we have our modern process of casting in fibrous plaster, which is also plaster of Paris (sulphate of lime).

The use of stucco-duro was known as far back as 3,500 years B.C. Stucco-duro had been exhumed in the early part of the sixteenth century, and in this series of slides, obtained from the tombs at Rome, executed in the first half of the century, you can see the actual marks of the metal tool. This work was modelled *in situ*, and was not intended to be seen by daylight, consequently perhaps some slight imperfections were excusable; but the work was very fine and wonderful for all that, and coloured also.

Later, a band of artists, trained by Raphael, executed much work in Italy and France. The photographs seemed to indicate that some parts of the work were cast and stuck up. One photograph distinctly showed the foundation or inspiration of the English school of flat relief work, and I think I may safely say this absolutely flat decoration is again being revived in a healthy way. Troubles followed in Italy, and this band of artists had to escape from Rome and were scattered. Some went in one direction, some in another. Some went to Florence, some to Venice, and some to Mantua, where a school of modellers was founded in each place. The art spread all over Italy, and from there to France, where Primaticcio decorated Fontainebleau for Francis I. This, however, was by no means the first stucco work executed in France.

The first stucco-duro work in England was carried out at "Nonsuch" Palace, on the hills between Epsom and Cheam, Surrey, from where the art, fostered by the Italians, spread, sooner or later, to Longleat. An English plasterer named Charles Williams, who had modelled at "Nonsuch," and travelled in Italy, carried out the Longleat work, and that on the walls of the giant's chamber, &c., in the first Hardwick Hall. This first work was of very simple character. In the later hall the frieze in the throne (4 feet 6 inches deep) was done by men trained by Chas. Williams, and coloured in tempera. The leaves were simply dabbed on in large groups, and shaped with a small metal tool or trowel, and slightly undercut at the same time. They were done very quickly and simply. Sometimes the birds and animals were painted on the groundwork instead of being modelled.

It was found that the material was rather difficult and inconvenient to procure in those days in this country, because of the marble dust and other ingredients that were necessary; and the art did not live long in the hands of the English plasterers after the Italian fashion, but the Englishmen stuck to their parge-plaster and developed an art of their own. The first development in the English plaster ceilings took place in the form of very simple panellings formed by beaded mouldings, with little bits of sprigs of modellings stuck at the mitres and angles, and with rosettes, &c., in the panels. Then they added simple rounded mouldings, and this gradually grew, as shown by the slides, until they covered the ceiling all over with easily repeating arrangement of panelling. This sort of thing continued to develop by degrees, and although the modelling is very, very simple, I think that the work of this period was perhaps the purest. The leaves nearly all took a slight concave form, with now and again convex lumps of flowers, fruit, bosses, and heraldic bearings.

Now we come to the exterior pargework. This type of work was done practically all over the country, and in London particularly, before the time of the Great Fire in 1666. The timber construction of the buildings was covered mostly all over with this parge plaster stuff, which was as tough as leather, and weather-proof. Old engravings of London pageants and street processions show this very clearly. The work was of a simple type, put on with a trowel *in situ*, in panellings and flowerings in between and under windows, across beams, and in the gables and oriel coves. I am sorry to say the examples shown have been a good deal filled up with whitewash. One very interesting feature about this pargework is that you can, in Essex, Norfolk, and Suffolk (particularly Norfolk and Suffolk), drive through various districts and every few miles can mark quite a distinct change and type of work, showing that it was done by the native and local plasterers or "daubers," or perhaps masons, and that they worked in their own little radius, and had their own set of patterns, which they varied. Then we come to the same material used inside buildings. The examples shown were of overmantles and friezes in cottages at Barnstaple and elsewhere, showing that the art was by no means confined to the larger buildings of the wealthy, but that it was general.

Then we come to the Elizabethan period. We have an example in Burton Agnes, which is attributed to Inigo Jones, and I want to call your special attention to this, because, if this is so, it was done before his visit to Italy, and was done by traditional craftsmen. The piece of work referred to was from a semicircular vault once existing in Burton Agnes Hall, long since perished save but the fragment shown. The work was modelled scrolls of roses, done *in situ*, and coloured. This was one of the most beautiful bits of modelling we had. There is only a small portion of it left. Jones's work after his visit to Italy is absolutely different and distinct; it is more set and orthodox Renaissance work, and without the freedom and life there is in this earlier work; very stately and fine work all the same.

Other slides illustrated in great detail the drawing-room ceiling at Speke Hall, Lancashire, where there are many panels between beams, all different in design. Each panel is different in detail and type of flower, growing from a set rhythm and stem work.

Several very interesting examples of ceilings of this type of work, in which the stem work was modelled direct into the ceiling, partly pressed with a die or stamp, and partly cast and stuck up so far as the flowers and lumps were concerned, were illustrated, including work from Kellie Castle, Fifeshire, with a full explanation of how each example was done, attention being specially drawn to the resource of the builder, or architect as he was then, in taking advantage of the opportunity given by the rooms formed in the roof space and the quaint constructional developments afforded by this means, which were taken advantage of.

Slides were shown of the flat ceiling of Queen Victoria's bedroom at Holyrood Palace, Edinburgh, by kind permission of His Majesty the King, who enabled photographs to be taken and shown.

The ceiling of this room was formed centrally into a large square panel by a moulding bound round by a belt of leafage and fruit modelled and cast in individual members, and stuck up leaf by leaf and fruit by fruit in a continuous growth of decorative rhythm. Bounding the large central square panel at the cardinal points were four circles of leafage curiously modelled, dividing four V-shaped panels, filled with straggling stem work modelled *in situ*, and vine or oak-like leafage, cast separately and stuck up loosely in one rich filling.

The lecturer then went on to describe and illustrate the revival of stucco-duro *in situ* modelled ceilings of Inigo Jones's, Webb's, Wren's period, by Italian plasterers, who wore goggles to protect their eyes from the falling fragments of lime stucco which they used. Fine examples were shown from Coles Park; Ashburnham House, Westminster; Holyrood Palace; Balcardine House; Brickwall House, Northiam; Grantham House; Belton House; Melton Constable; Groombridge Place, and elsewhere, showing the beauty and technical value of stucco-duro as a material for working *in situ*.

In all these examples it was explained how the quality of the material, which could be regulated in the setting to any degree to time by the introduction of various ingredients, enabled the modellers to give sharpness of edge, thinness of substance, and depth of "undercutting" and relief to any extent; how the flower-heads stuck out from the bulk and were attached by isolated stalks steeped in the same "plaster"; how in some cases the stem work corkscrewed round and round the highly-relieved lengths and garlands of modelling, and how the leaves and flowers could be modelled as thin in substance as the petals of a rose or a piece of drawing-paper, which was a perfectly legitimate and beautiful process for the well-burnt and long-slaked lime and fine grit material then in use, although not so for the soft plaster of Paris process now in use. The lecturer went on to show by comparison the fruitless imitation of this type of work;

at the present time, and how impossible it was to procure anything like the same result by the modern process of modelling in clay and trying to reproduce it by casting in plaster of Paris from gelly moulds in fibrous plaster construction. The softness of plaster of Paris would permit neither the thinness of substance nor the sharpness or crispness of edge without breakage, the final result ending practically in a makeshift or parody of the old work done *in situ* in the stucco-duro material.

He urged that this material might be forthcoming again by the desire of those who wished to use it, and by arrangement between the architects and builders to put down the lime and keep it stored for a few years, as was done heretofore. This class of work was undoubtedly desired, as manifested by the attempted reproduction of the so-called "Georgian" ceiling decoration for many years past.

Until such time the best possible means of arriving at the nearest result was in modelling the leaves, fruit, flowers, &c., individually, and casting them individually in plaster of Paris or Keene's cement, and tucking them up into a prepared hollow-ground work *in situ* on the ceiling, as illustrated in two or three examples thrown on the screen. Even this would not give the same beauty of definition, but it was the next best thing, and required the judgment and arrangement of an artist which was not always forthcoming in the purely mechanical training of the modern plasterer, although there were signs of considerable ability in this direction.

The lecturer said that he had sometimes been misunderstood and charged with predilection, almost to prejudice, for one kind of work in preference to another, namely, the earlier work for the later, but such was in no way the case. He believed he would be borne out by all others who knew anything of different materials and processes that each kind of work was equally beautiful, interesting, and legitimate, according to the right use of the various plasters employed.

A few examples of the plasterwork following this period were then shown, illustrated by examples of Wren's later work, in which the Dutch modellers re-introduced for a time the French type of work very indifferently; also the work of Hawkesmore, Archer Talman, and others, and describing the work of the brothers Adam, who took their inspiration from the Pompeiian masterpieces and gave these islands the last bright flash of "artistic" plasterwork in a plaster composition in which they were financially interested. Then followed that degrading period of so-called pseudo-Classicism, in which the London squares and streets, and also the provincial towns revelled for a time—imitation Classic "ornament" that sent a thrill of hatred against plaster decoration, and which had created a prejudice that, with a large portion of the general public (and even amongst some architects) had lasted to the present day, and done so much to retard any real development of the plasterer's art.

Mr. Bankart then passed on to modern materials and modern work, showing by illustration that a considerable amount of work had been done by some living journeymen plasterers, who had, by diligence and careful study, picked up the threads of past traditional methods of working, and applied that knowledge to modern materials and modern construction with considerable ability and success as artists as well as mechanics. This, he maintained, was a "feather in the cap" of the present time, and gave bright hope of the foundation of a new living school of decorative plastering. The fault, he maintained, was not the plasterers', but the misfortune of their training for generations back in being trained to think that mechanical accuracy and perfection of surface was the zenith of plasterers' work.

The covering of the walls and ceilings of our homesteads with insanitary printed patterned papers and pulps was but the manifest desire for decoration of some kind, and this was evidence that something better, something genuine, was desired.

Much good and interesting plasterwork was being done in different parts of the country, and there was every encouragement for the younger generation of plasterers to study and take up the once living art of their trade, and to develop it in a manner suitable to and worthy of our modern methods of construction—and this he firmly believed would come sooner or later.

The lecturer dwelt at some length on the opportunities offered to architects in the modern system of concrete construction, in the shaping of concrete barrel vaultings and saucer domes for simple decorative treatment—in the arrangement and placing of iron girders to form a scheme of design apart from the purely engineering aspect of their setting—in the decorative treatment of concrete piers and pilasters; the simple vaulting, cross vaulting, and sectioning of rooms in the roofs of houses and public buildings, as illustrated by many slides shown on the screen.

Details of many simply decorated flat ceilings were shown, in which there was quite a modern spirit in the arrangement of belts of modelling, possessing distinct modern interpretation and refinement of design and workmanship, whilst at the same time reflecting something of the traditional treatment of the past.

In conjunction with this, various interesting methods of working suitable modern plasters were explained, the lecturer concluding with the optimistic hope and belief that architects were giving much more thought and attention to the natural constructive development of their buildings for decorative purposes than they had done in the past.

Mr. G. A. T. Middleton, in proposing a vote of thanks to Mr. Bankart, said the lecture must have brought home to them how extremely rich England was in artistic work, almost as much as Italy. He was afraid, however, this was not always realised and appreciated, nor was the same care taken of them, and consequently examples of old craft work were destroyed or lost to the nation. He knew of pieces of wrought-iron work which had disappeared from their original places, and Mr. Bankart no doubt could call to mind many pieces of old plaster work which had been lost to sight either by the demolition of buildings or by sale to foreign agents or Americans.

Colonel F. S. Leslie, R.E., who seconded the motion, said he was acquainted with some of the best examples of plaster work in Egypt. The designs were generally in direct geometrical patterns and floriated arabesques. The work was very beautiful, and he said he had no doubt that it was modelled direct on the walls and ceilings.

Mr. Bankart, in reply to the vote of thanks, said the disappearance of pieces of English craft work was largely due to the transportation of old examples to America. The Reindeer Inn at Banbury, which had a splendid Jacobean ceiling, was now threatened, and he urged the artistic societies to co-operate and so prevent the house being carted away bodily out of the country.

## "CASTLES IN THE AIR."*

*(Concluded from last week.)*

It is rather remarkable that, in these days of boasted freedom, we find that the higher we go in the social scale, the less so-called freedom there really is. Till we come to the king himself, and note that he cannot utter a syllable without consulting diplomatic and other forces, and must take counsel with the wisest men he can find before he can take tea with his friends.

The more educated and the more sensitive we are, the less our ugly actions will be, or should be forgiven.

Again Ruskin helps us with the statement, "Ignorance, which is contented and clumsy, will produce what is imperfect but not offensive. But ignorance discontented and dexterous, learning what it cannot understand, and imitating what it cannot enjoy, produces the most loathsome forms of manufacture that can disgrace or mislead humanity."

Some of us have to spend most of our time in work for others, which we hate and detest. Let us remember for our consolation that the faithful performance of duty never degrades; and bear in mind that at such times castle building may be made a special help and blessing. To all so circumstanced let us say, build on, have courage, your time will come when the beauty you have stored in your minds must bear good fruit—perhaps when you least expect it.

To bemoan and chafe against your lot will help you not. Only looking for the moral purpose of it, as it affects your own character, and by determination to see the beautiful and true and not the ugly, will you gain patience and strength.

We may learn the possibilities and limitations of material from the dead. But only from ourselves can we gather those vital forces of thought and feeling without which our work will be mischievous. The reliance on moral bases will very much help us to avoid the undue adulation of technical skill. Our powers of execution should always be secondary to the mental and moral qualities of our work. And must be so, if we are sincere. But if we merely choose a moral theme to display our technical skill, we are soon betrayed

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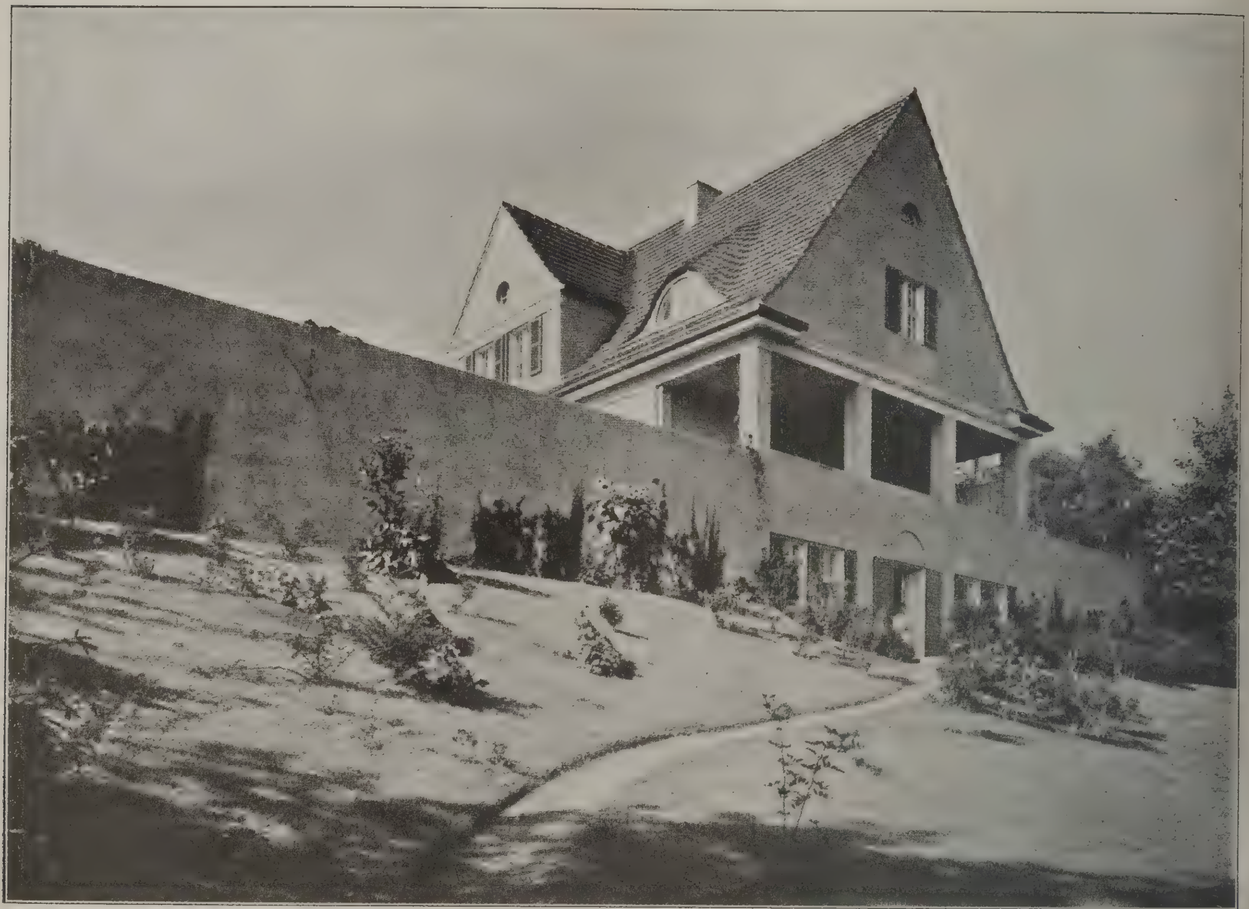
* A lecture delivered by Mr. C. F. A. Voysey on March 2 at Carpenters' Hall, London Wall, E.C.

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Moderne Bauformen.*

COUNTRY HOUSE AT NEUBABELSBERG, FOR PROFESSOR Dr. RIEHL.—Herr Ludwig Mies, Architect.

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and found out by the thoughtful observer who will value our work, not for its vital force, but for the dexterity it displays. Would we not rather create sermons in stones and poems in pictures?

We are surrounded by museums full of a heterogeneous mass of objects supposed to have an educational value. And yet how little that is really beautiful are we now producing? Much less than we were before we had the museums. Is it not because we have regarded the outsides of things and worshipped idols, and not held fast to the mental and moral qualities that originated those symbols? It is hoped our castle building will help us to see beneath the surface of things; "to live more contented lives; to win the greatest pleasure from the smallest things; to do what is likely to be serviceable to our immediate neighbours, whether it seems to them admirable or not; to make no pretence of admiring what has really no hold upon our hearts, and to be resolved in refusing all additions to our learning, until we have perfectly arranged and secured what learning we have got—these are conditions and laws which will lead us up to fine art if we are resolved to have it fine."

Castles can be built by those who have never passed out of their own country. All the material needed may be found in their own hearts and brains and is of such a nature that all nations can understand them. Neither are they of any time, but of all time. Only finer, and more full of beauty as we advance in character.

Let us be consoled with the thought that such building brings no applause, calls for no press notices, gains no academy honours; so we are not exposed to the weakening effects of popular praise—all the reward we can ever get, or should ever hope for, is a clearer sight, a deeper love and a juster sense of values.

It is an industry that will not interfere with our daily duties but, rather, cheer us on the road.

The material for our castles in the air is subject to no freights or tariffs. It comes to us free; indeed, it floods into our minds as fast as we can use it.

The many problems that arise out of our common occupations are the precious stones that we need for our main walling. They must be examined and looked into, dressed and squared, and their fitting places found.

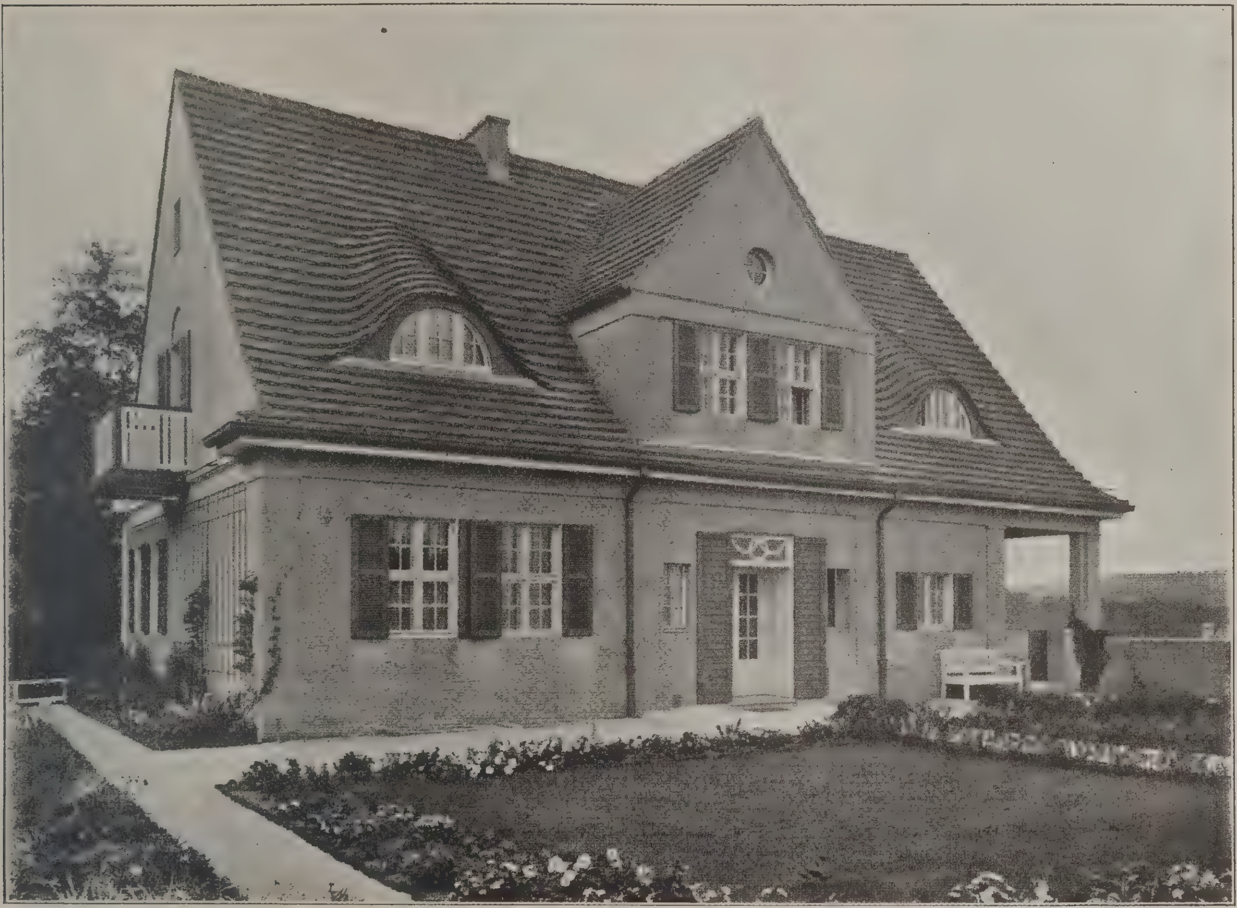
Thank Heaven! this form of building never comes into the market. It never will be the subject of thirteen different kinds of valuation, like our land. This is a great blessing because taking stock of our moral and mental progress is a dangerous and discouraging operation. The less we stop to value our building, the better. We need encouragement the more sensitive we are, not praise that produces satisfaction, but encouragement that goads us on. In valuing our own work we either blame or praise it too much, and possibly what we try for is often more precious than what we accomplish.

Castles in the air must not be built out of stray fancies or sudden external charms. Artists often speak of inspirations and suggestions which they gather from material things. But to fasten on an idea, so derived, and then build round it, is a dangerous method. All our best work is built up slowly from the beginning. First we must examine the motive—why do we build at all? Then the requirements; and then the materials and conditions Everything we make, from a coffin to a cathedral, must proceed in this order. It is a useful and practical order of procedure for daily life. It will not discourage the emotions, but it will prevent them from running away with us. This order of sequence is no one man's invention but the orderly process of all thoughtful craftsmen. The significance of it is often clouded over by the emotionalist who traces all good work to one faculty instead of the combination of them all.

By combination of our faculties we are able to appea through our work to the greatest number of our fellow creatures. Here a bit of emotionalism, here a little fitting use of material, here an appeal to the senses, here a suggestive thought, a touch of reverence, and an appeal to the spirit—so that all minds, although coloured with a bia

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Moderne Bauformen.*

COUNTRY HOUSE AT NEUBABELSBERG, FOR PROFESSOR Dr. RIEHL.—Herr Ludwig Mies, Architect.

for one quality more than another, are reached. Colour and form and texture seldom appeal to the same mind in equal degree. So we need a wide and universally understood base for our castle building.

Many an artist is discouraged by finding his work unappreciated when the cause is that he has appealed to one faculty only, and that one possibly dominant in the few.

If you exhibit craftsmanship only, you cannot expect to attract the mind that is looking for thought and moral feeling, poetry or passion as well.

Infinity is an idea of the mind only partially conceived, but of vast importance to the artist. It is a quality of the sublime. We can only approximate to it in thought by reflecting on what it is not. It expresses mystery and keeps the mind open, and ready for fresh growth; and it makes us feel that the realms of thought are limited only by our particular stage of mental and moral development, which is for ever advancing, or should be. Our air castle is, therefore, never finished; we feel that every fresh beam of light is a blessing. Whereas the opposite of infinity is the very negation of growth and development. It leads us to reject all that we cannot prove, and disbelieve in anything we cannot measure and weigh. It leads to a materialistic state of mind and to a contentment with the merely practical which deadens the emotional and spiritual.

Oh that we could stimulate that state of mind which puts the moral and mental activities before the five senses. More spirituality and less materialism is the only remedy for our present state of ugliness. Then shall there be more real art and less talk about it. We shall enjoy beauty in the best way; that is, by growing like it.

The rise and fall of nations has been due to the change of balance between the spiritual and material activities, and we find dominating activity in material matters leads to a weakening of the poetical, æsthetic, and religious vitality. The machine has turned our thoughts to material things, until we have produced pianolas and gramaphones, and steam whistles and hooters welcome in the New Year, instead of as of yore, peals of merry bells and happy human voices. We need castle building to help us to revive the spiritual side of our natures, and we hold that it is the special duty of artists, while dealing with materials to breathe into them that spiritual breath of life which may yet save our nation from extinction.

"Remember," says Ruskin, "we can represent with prudence or success only the realities in which we delight. What we have with us and before us, dearest to our sight and hearts, we can gloriously express to others; and nothing else can be truly seen and loved. And unless that first be made beautiful, idealism must be false and imagination monstrous." As craftsmen we have to consider convention—or what some call tradition when applied to buildings—I mean that blind following of custom (not always blind, perhaps).

Fear is generally the master of convention. I appear before you in black because I am afraid of what you would think if I were to appear in purple and gold. We do innumerable things merely because others do them, and we have a vague fear of the consequences if we did not go with the stream. It is good for trade; things can be made by the gross, men can repeat the same design until it has paid for the patterns and all preliminary expenses. All these considerations are governed by a genuine practical common sense and must not be ignored, although they help us little with our castles in the air. Some of us welcome convention as a screen for personality; we like to hide ourselves behind convention, and so avoid attention; the sensitive nature is miserable when attracting attention.

If building castles in the air were more common, individualism would be strengthened, it would cease to be peculiar to be oneself and sincere. Independence in dress and behaviour would not be so noticeable. And I think we should gain moral courage and that true sense of independence which makes us more concerned with our own conduct than with the conduct of other people.

We march on together because we are afraid of the opinions of others, or the trouble of regulating our own pace.

A regiment of soldiers marches to obey. Forced on, not by base fear, but by a recognition of a superior authority, and

AT CHATEAU FERVACQUES.
Drawn by A. N. Prentice, F.R.I.B.A.

therefore the soldier is not weakened by it. We need to be led by reverence not driven by fear.

The craftsman wants the freedom to obey, and emancipation from the degrading fear of the consequences of offending popular prejudice, or being thought wanting in good taste. We do most cordially hate to be thought wrong in our taste. And that feeling drives us to inquire whether we cannot build up our taste on facts and qualities that everyone admits are beautiful, viz., moral qualities.

If we can show that vermiculated surfaces express any moral quality that is not base, we will admit them on our castle walls; but, on the other hand, if such is the mechanical expression of a demoralised people, we cast it from us with scorn.

How much we might feel helped if we determined to limit our requirements to those essentials we have put into our castles in the air. In those we were not trying to imitate the tastes of our superiors, or of foreigners, or of schools who denounce all but that one particular style they have been brought up to imitate.

We shall not regulate our requirements by their money value. Many cheap things are dear at any price, and it is almost joy to go without, until you can have the best of its kind, and so avoid the reproaches of the ugly compromise.

Cold vegetables are less harmful than ugly dish covers. One affects the body and the other affects the soul.

Before you build anything, ask yourself for which side of your nature you are undertaking to do battle. For battle it will be.

You will find the whole world waiting for you and ready to administer to your flesh, only too delighted to be able to gratify your greed.

Your animal instincts have been studied with exquisite precision, and every appliance perfected to minister to and to multiply your physical wants. It will be an easy matter for you, if you are well off, and animal enough. But if you are rich in thought and feeling and have a lively appetite for ideas, you must brace yourself for war; it will be a hard long struggle, and cost you many a tear and many a sigh. But remember, we value that most for which we suffer most. And the more labour we bestow on most things, if it is the right kind of labour, the longer they last.

Countless articles are presented to us which are like something else only cheaper. Spurn them all. Admit nothing into your company that looks better than it is, and you will find this one determination to consort with that only which is genuine, will carry you a long way and help you to brush mountains of mischievous rubbish out of your road.

By limiting our needs and simplifying our methods, we feel more able to cope with the difficulties that remain.

If we have the speculative builder to deal with, we cannot hope to do more than tell him what we want, although he has not got it. And in time no doubt he will try to produce what we do want. It is a slow process and does not satisfy you or him. The fruits of such a course must take centuries to grow. Who knows? Who knows what good is done to you by cultivating such a want, and to him who hears you ask for it? It is in the spirit that all progress first takes form. Shape first your castles in the air—then you shall live in them.

It is almost an impertinence for me to go on telling you all these things, which you know as well as I do. But repetition helps the memory, and we all need perpetual encouragement to see that the trials and troubles of the craftsman's life are really the stepping-stones which lead to our right judgment, and tend to free us from degrading fear, if we will but regard their moral aspect and look for good in them. We weaken our power of producing beauty by dwelling on the ugly and painful side of things.

We want encouraging, too, to reverence natural law and order and to induce that habit of mind which shall dwell on the good, the beautiful and the true, and resist the evil effect of ugliness, or the petrifying influence of substituting material appearances for thoughts and feelings.

We need to encourage that power of introspection and of gathering light from others, without interfering with them.

Artists must be leaders of men, not drivers.

We need to be cured of our cold, calculating study of the outsides of things, from the hardening influences of materialistic methods and easy going reliance on antiquated schools. We need to be brought into the broad daylight of living problems and living thought and feeling, to be constantly reminded of the supremacy of mind over matter, and, by building castles in the air, to keep our minds actively employed in collecting and storing up all the beauty and loveliness we can find in mind and matter, and thus gain houses, not made with hands, for our souls to live in.

## COMPETITION.

London.—The Royal Colleges of Physicians and Surgeons recently organised a limited competition for the building of an examination hall to be erected on the site of Nos. 8, 9, 10 and 11 Queen Square, Bloomsbury. Mr. T. E. Collcutt, who acted as assessor, recommended that Mr. A. N. Prentice, F.R.I.B.A., Hastings House, Norfolk Street, W.C., should be selected to carry out the work out of the seven architects competing. This has been agreed to, and the following three premiums of 100*l.*, 75*l.*, and 50*l.*, have been respectively awarded to Mr. Henry T. Hare, F.R.I.B.A., 13 Hart Street, Bloomsbury; Mr. E. Stanley Hall, 54 Bedford Square; and Mr. J. W. Simpson, F.R.I.B.A., 3 Verulam Buildings, Gray's Inn.

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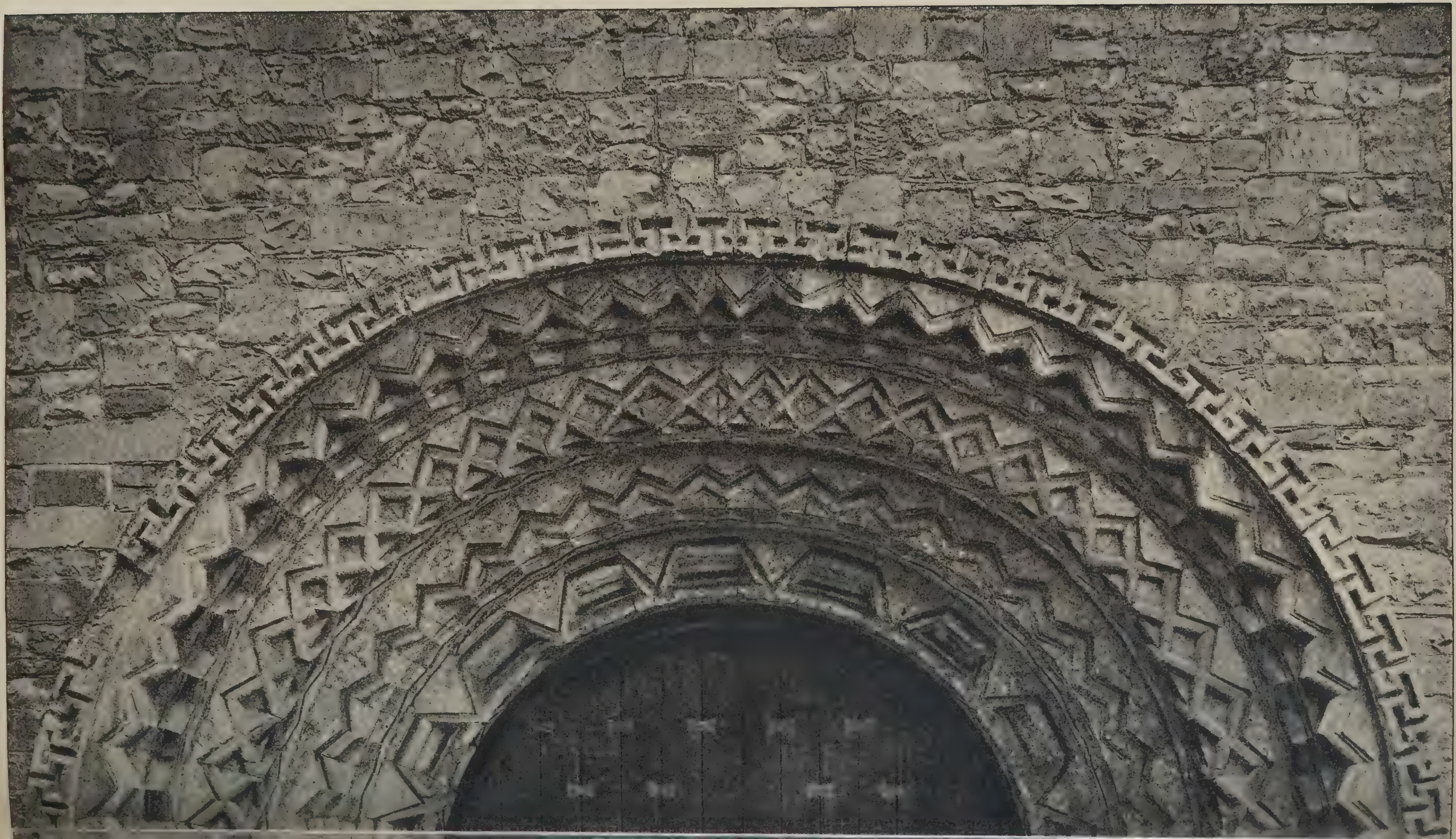

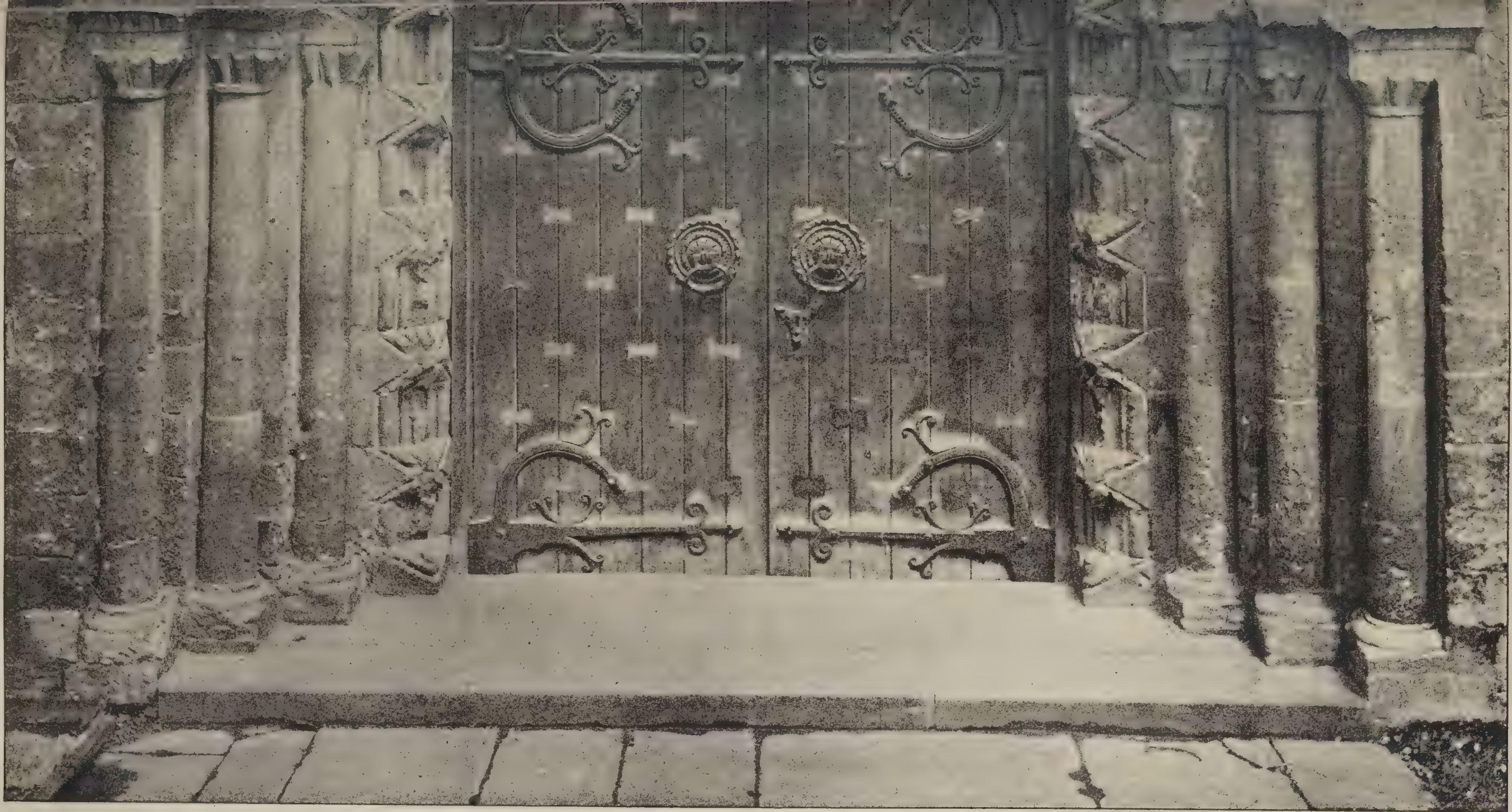

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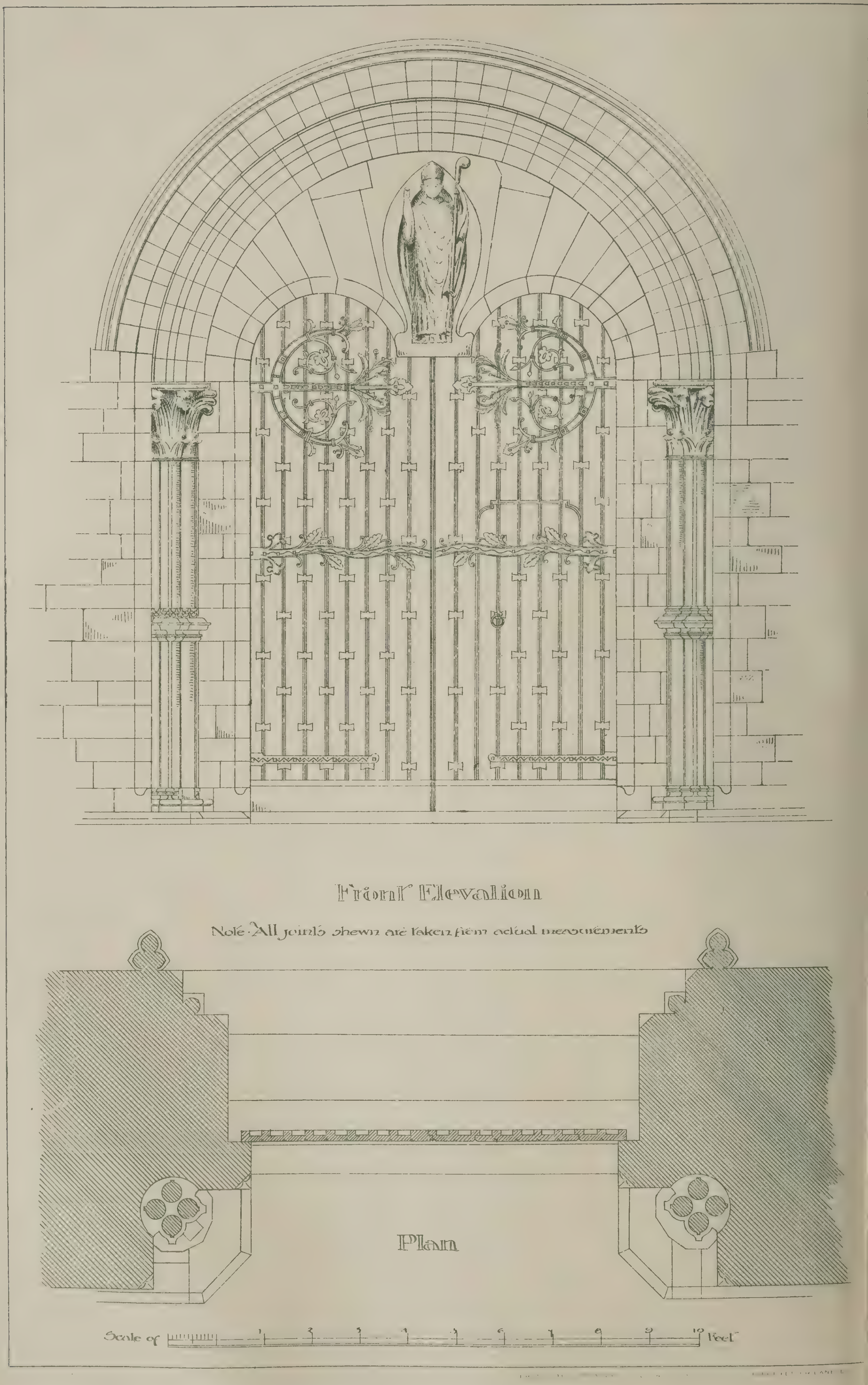
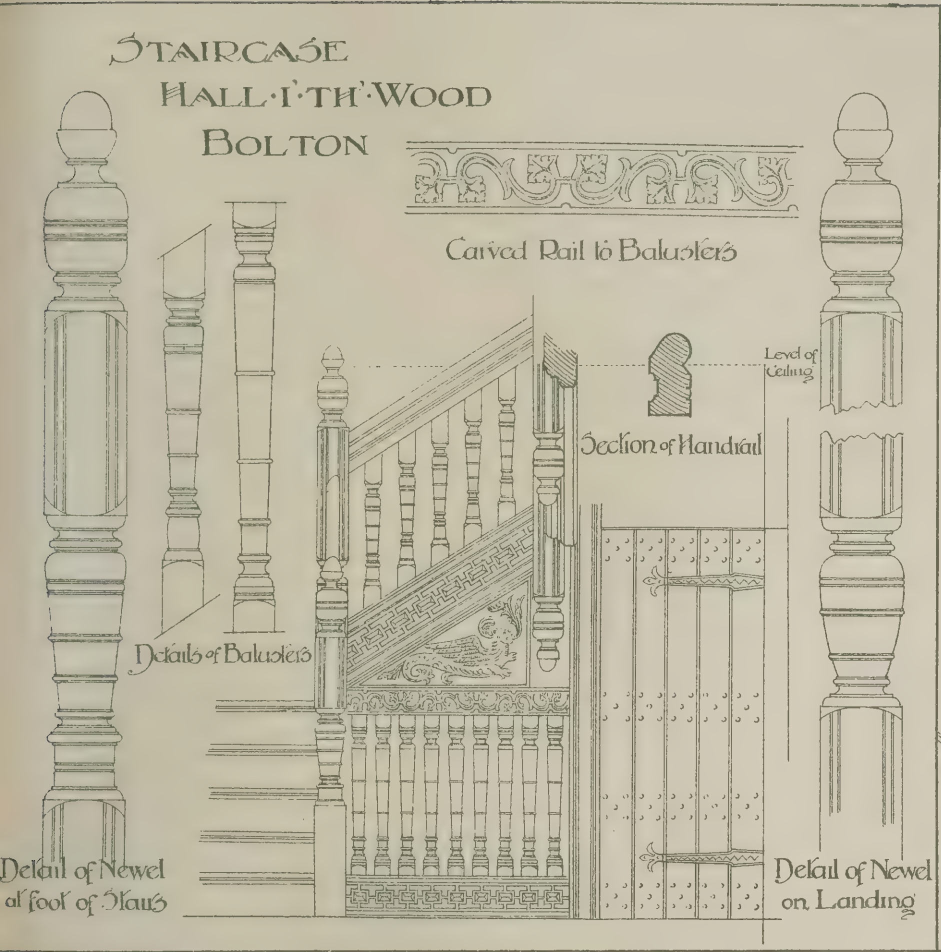


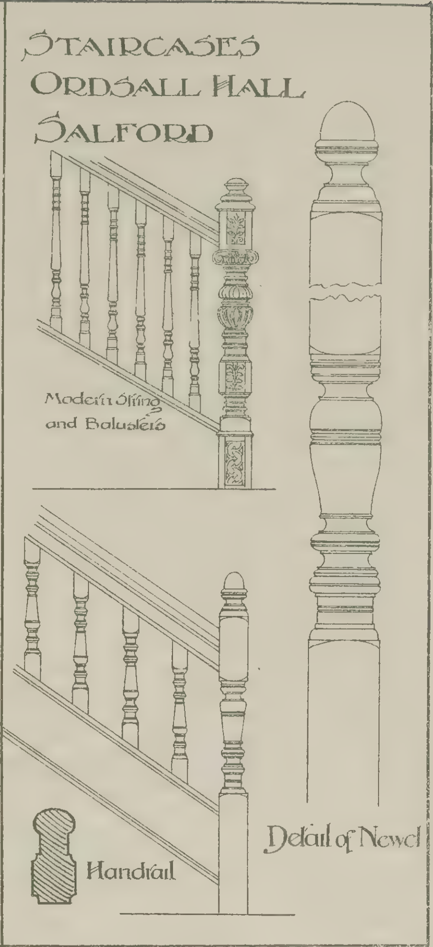
WEST ENTRANCE, LLANDAFF CATHEDRAL.

Drawn by Mr. W. EATON, A.R.I.B.A.

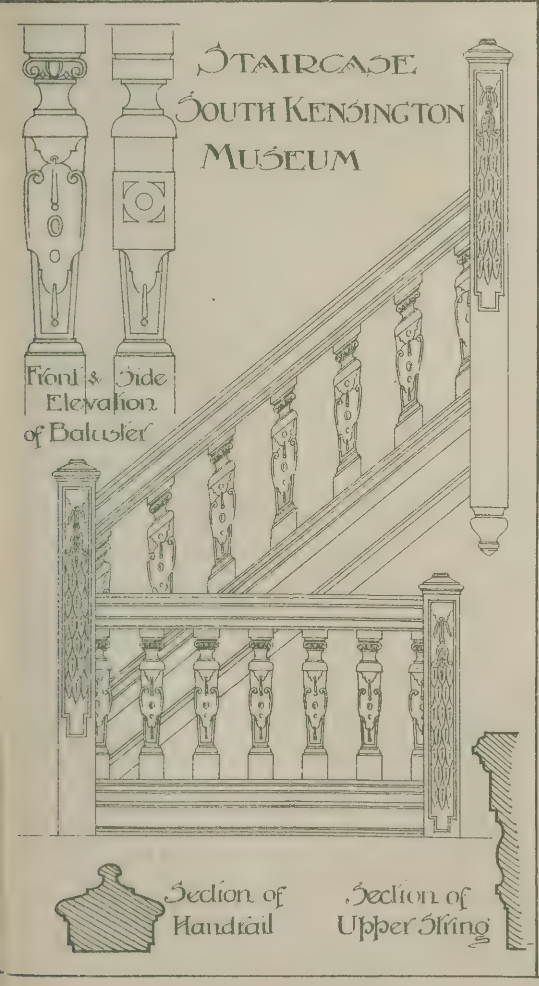
## STAIRCASE HALL·I'·TH'·WOOD BOLTON



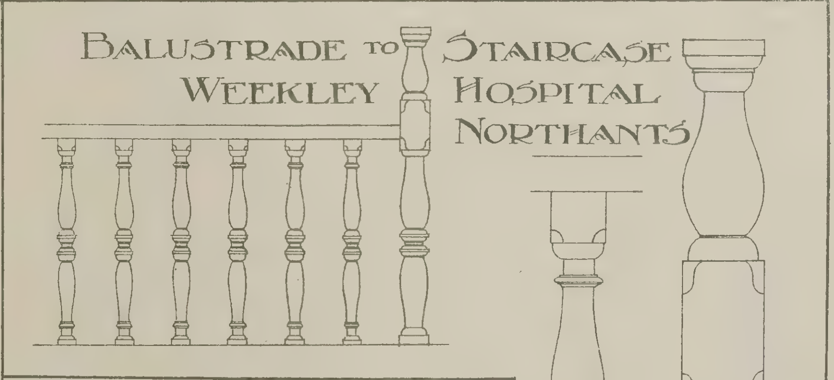
## STAIRCASES ORDSALL HALL SALFORD



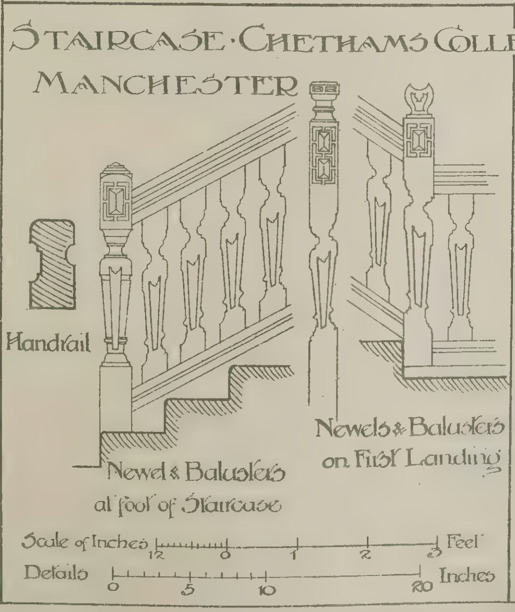
## STAIRCASE SOUTH KENSINGTON MUSEUM

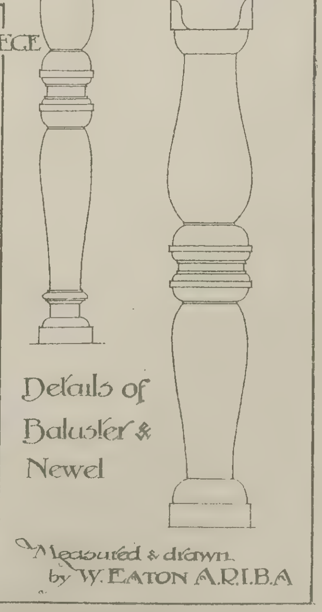


## BALUSTRADE TO STAIRCASE WEEKLEY HOSPITAL NORTHANTS



## STAIRCASE·CHETHAMS COLLEGE MANCHESTER


Handrail
Newel & Balusters at foot of Staircase
Newels & Balusters on First Landing
Scale of Inches 12 0 1 2 3 Feet
Details 0 5 10 20 Inches



Measured & drawn by W. EATON A.R.I.B.A

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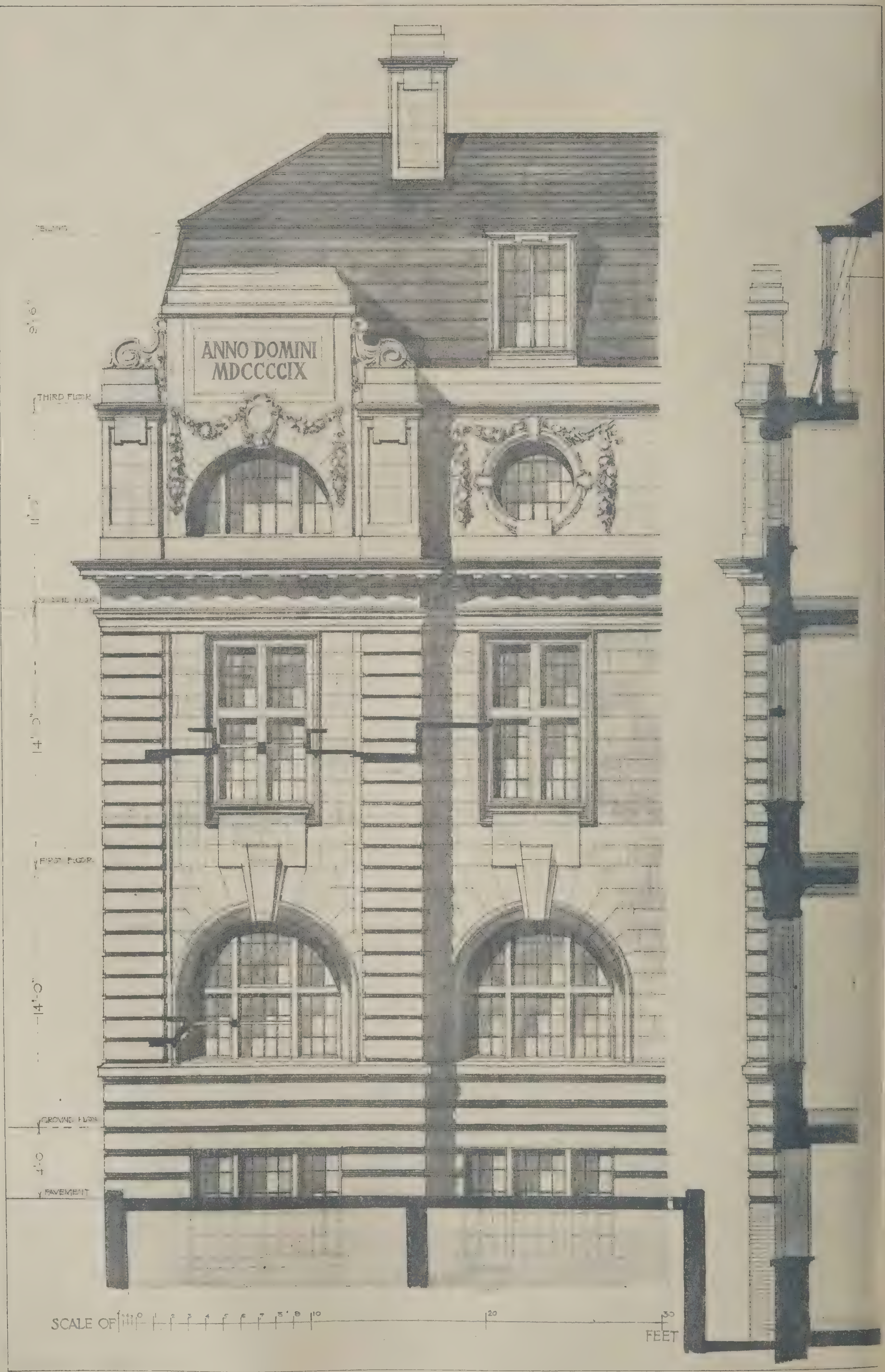

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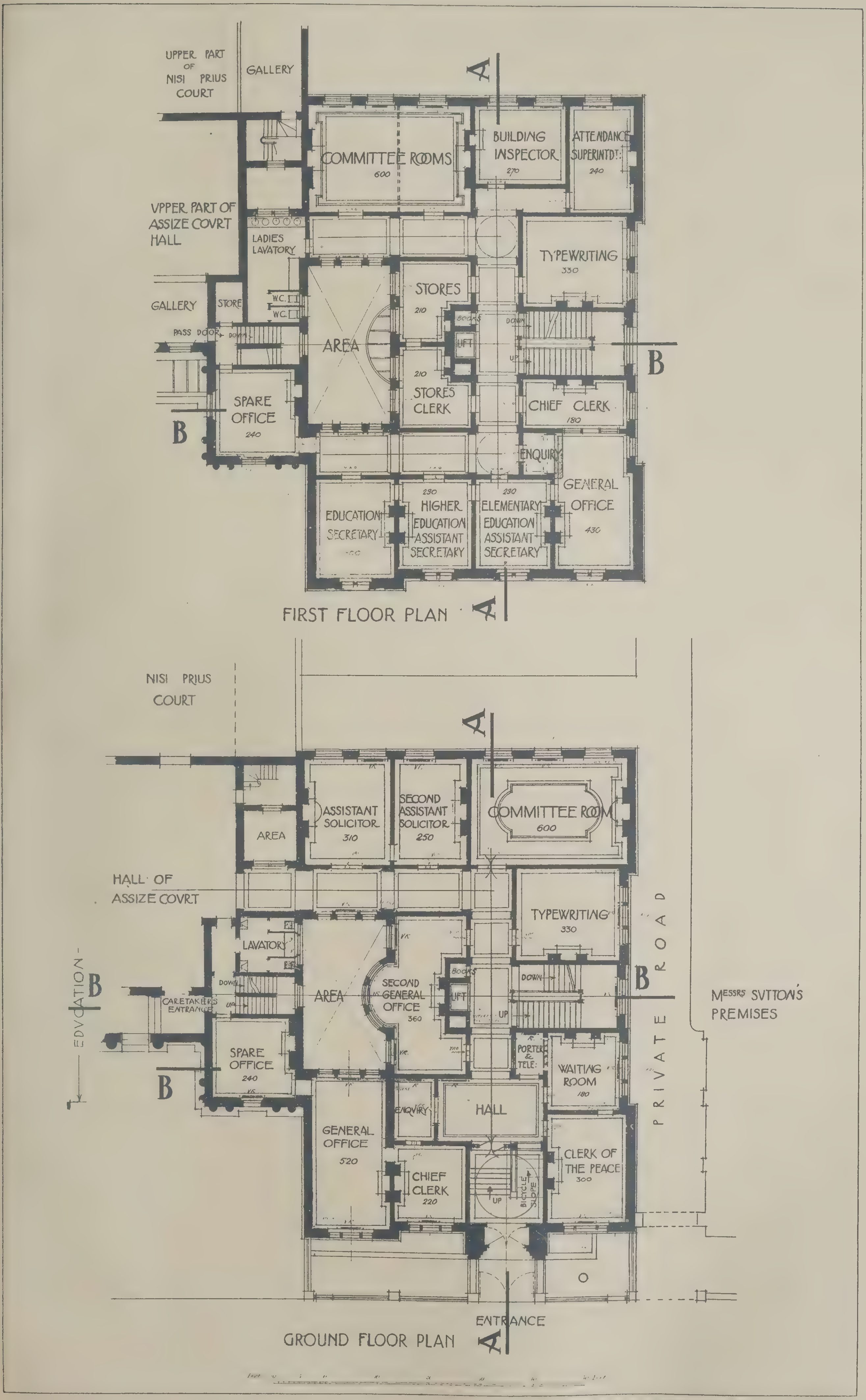
Competition Design for Berkshire County Council Offices, Reading.

Messrs. GIBSON & ROBERTSON, Architects.



## Competition Design for Berkshire County Council Offices, Reading.

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UNIVERSITY OF ILLINOIS

# The Architect.

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## FORTHCOMING EVENTS.

*Friday, April* 1.

Leicester and Leicestershire Society of Architects : Students' Evening.

*Monday, April* 4.

Royal Institute of British Architects : Paper on "Architecture on the Eastern Side of the Adriatic," by Mr. George Hubbard, F.S.A., F.R.I.B.A.

*Tuesday, April* 5.

Institution of Civil Engineers : Papers on "The New Clyde Bridge of the Caledonian Railway at Glasgow," by Mr. D. A. Matheson ; and "The Queen Alexandra Bridge over the River Wear, Sunderland," by Messrs. F. C. Buscarlet and A. Hunter.

*Wednesday, April* 6.

Royal Sanitary Institute : Paper on "Sanitary Aspects of Floods and Measures to be Taken to Prevent Epidemics Arising Therefrom," by Dr. A. J. Martin, of Paris.

Carpenters' Company : Paper on "The Craft of Repairing Buildings," by Mr. Thackeray Turner, F.S.A., F.R.I.B.A.

Royal Archæological Institute : Paper "On Two Types of Brooches from the Island of Gotland, Sweden," by Mr. E. T. Leeds, B.A.

## COMPETITION FOR WELSH NATIONAL MUSEUM.—II.

WE may gather from the four designs rewarded by the assessors that proximity of the reserve collections to the exhibition galleries of the departments to which they belong is to be deemed of importance; that there is no objection to the public being admitted to more than one floor; that the subordination of the Museum to the City Hall, though perhaps desirable and certainly admissible, is not essential; that it is immaterial whether the entrance is on the south or west or both, and in the light of these principles we may estimate the approximation to success of those designs that have failed.

Messrs. LANCHESTER & RICKARDS, as might have been expected, have tried hard to win, and feeling no doubt a certain amount of difficulty in deciding on the right answer to primary questions, have sent in two designs. Both of these are similar in outline, but very different in their internal arrangement. The main block corresponds to that of the Law Courts, but the required accommodation necessitates an extension northwards, to which a semicircular form is given. In the internal disposition the authors have made the fatal error in both designs of assuming that the reserve collections need not be adjacent to the public exhibition galleries of their respective departments. Although in one design (No. 31) the departments for art and industries, which are on the first floor, have their reserves also on that floor, the remaining departments have their exhibition galleries on the ground floor and the reserves on the first or second. In this design the entrance is on the west, leading through a vestibule to a central hall, and continuing on the main axis to the lecture theatre of semicircular plan. North and south of the central hall are the departments of Welsh natural history and of history and antiquities. A very fine and impressive plan is the result, but it fails *ab initio*. The second design by Messrs. LANCHESTER & RICKARDS (No. 44) has the reserve collections all together on the ground floor, which is wholly given up to students, save for the aquarium, children's museum, refreshment room, and administration, the public exhibition galleries being all on the first floor. In this design the entrance is on the south front.

One of the finest designs in the exhibition is that by Mr. JAS. B. FULTON, which, with an entrance on the south, has on its major axis a grand central hall 220 feet long by 50 feet wide, a provision of supererogation to the minimum accommodation required by the particulars. Perhaps this was thought by the assessors to be extravagance and combined with some laxity in respect of reserves, put the design out of court. Thus the reserve for zoology is on a mezzanine, although the exhibition galleries of the department are on the first floor. The reserve for history and antiquities is also dissociated from the public galleries in respect of floors, and is also a long way from them. Mr. FULTON has designed a pure Greek building with beautifully drawn detail. Perhaps this was not considered "in sympathy" with the Baroco detail of the City Hall.

Pure Greek detail has been adopted in two other notable designs, and in other cases Greek with a modern French feeling is the basis, so that it almost looks as if we were in for a Greek revival.

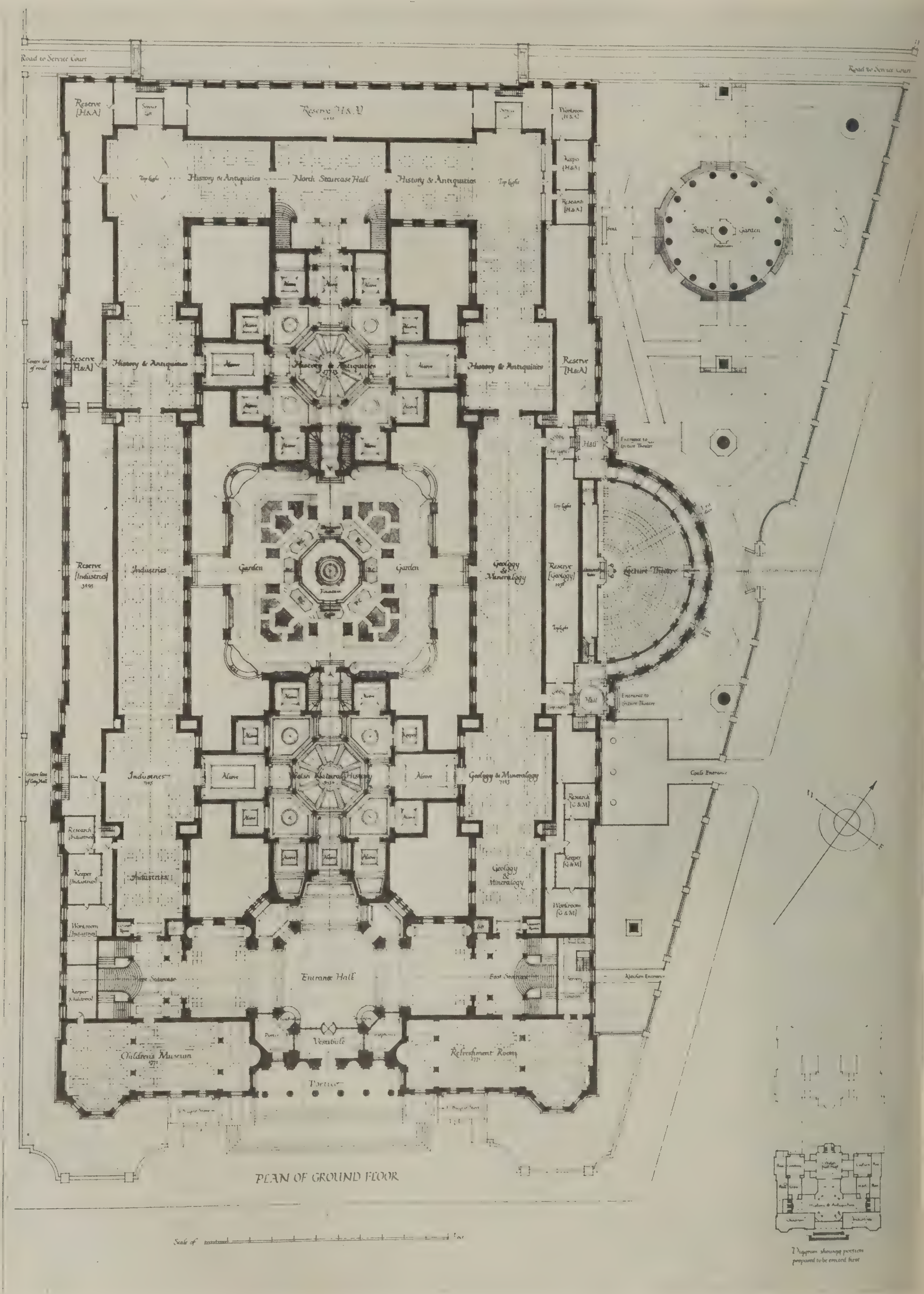
Professor C. H. REILLY, with Mr. H. McG. WOOD and Mr. H. O. BURROUGHS, contribute one of the Greek designs, and in their plan have made a strong effort to unite the frontage lines of the City Hall and the University Building by laying out the garden at the rear of the City Hall to axial lines of University College, and on a diagonal to these, arranging an entrance to the Museum in the re-entering angle between the frontage lines of the University Building and the City Hall. Their Park Place front is parallel to the road, and leads on to the rear elevation of Mr. CARÖE's building. In their internal disposition the reserve collections, children's museum, and sculpture are located on the ground floor and the public galleries on the first floor. Thus, like Messrs. LANCHESTER & RICKARDS, the authors have started from the wrong basis, though on this basis they have produced a fine plan.

Mr. A. GILBERT SCOTT sent in a beautiful design with pure Greek Doric for the *mot d'ordre*, but he has ignored the conditions and fully coloured his detail. His plan with entrances on all four sides is good, with a great hall on the longer axis and the reserve collections in segmental galleries on each side, too distinct from the public galleries to meet the views of the selectors.

Messrs. CROUCH, BUTLER & SAVAGE have an admirably simple plan, but we doubt if they have provided sufficient space for the reserve collections, which are quite apart from the exhibition galleries and not allocated to the several departments. The design of their exterior is excellent, with a central tower.

Messrs. GARRATT & SIMISTER, in conjunction with Messrs. BUCKLAND & FARMER, have submitted an excellent and very compact plan by which they are able to restrict the length of their building from south to north to the dimensions of the City Hall, and yet, notwithstanding this compression, they include all the public galleries except the art department on the ground floor. Their reserve collection being on the mezzanine and first floors has, however, disqualified their scheme. The exterior is well treated with a good tower.

Messrs. ERNEST RUNTZ & SON have an effective ground floor plan, and, having taken the whole of the site,



SELECTED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—Messrs. A. Dunbar Smith & Cecil C. Brewer, Architect

are able to include the greater part of the accommodation on the ground floor; the main entrance is on the west side, with a secondary one on the south; a long hall on the longer axis is an impressive feature of the plan, and a semicircular art gallery, though unusual, is quite effective. The reserve collections are somewhat scattered. The external treatment is quite successful with two domes and a broad treatment of windowless wall.

Messrs. Forbes & Tate send a good plan, but the reserve collections are on the mezzanine and first floor,

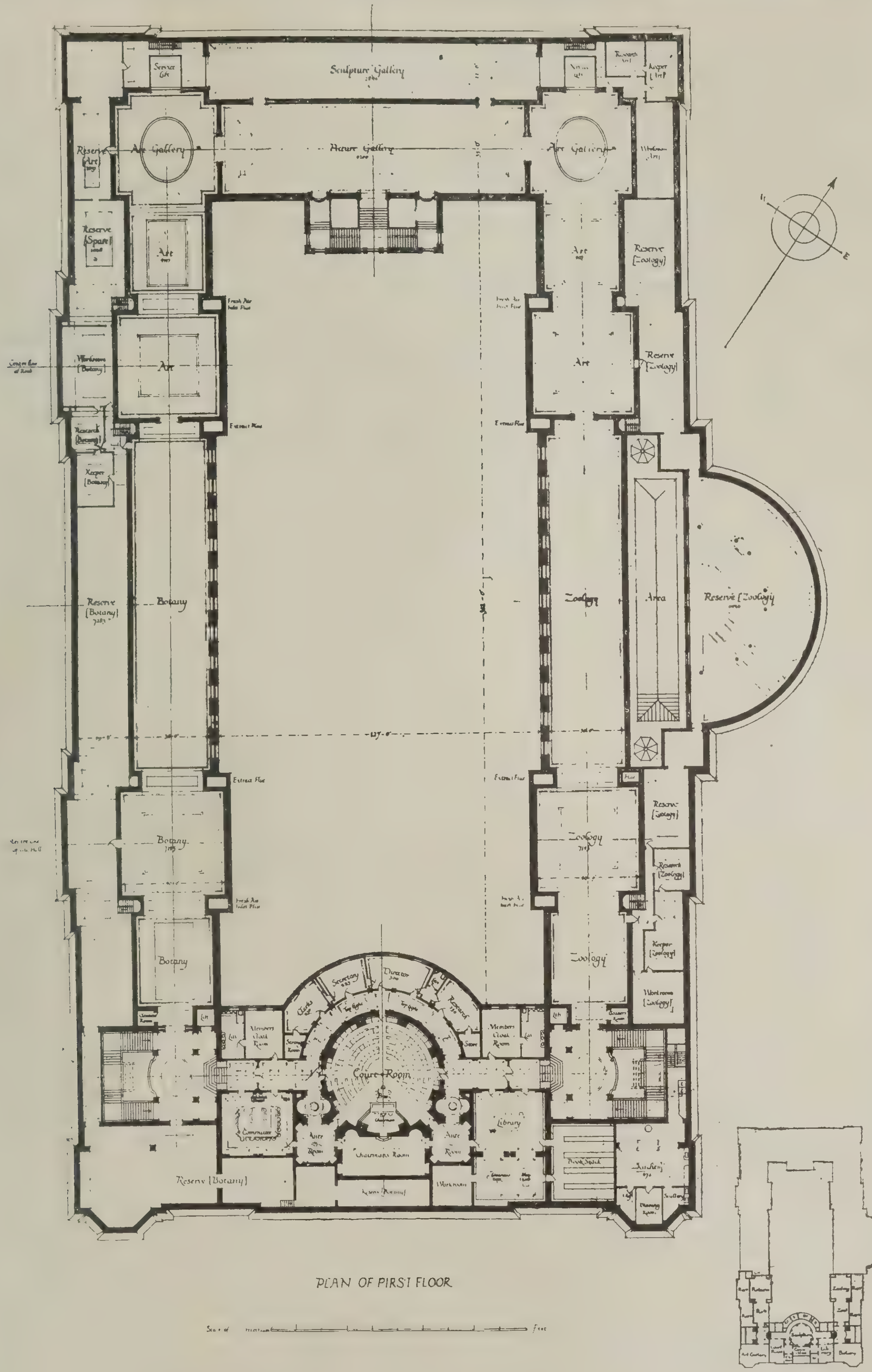


Diagram showing portion

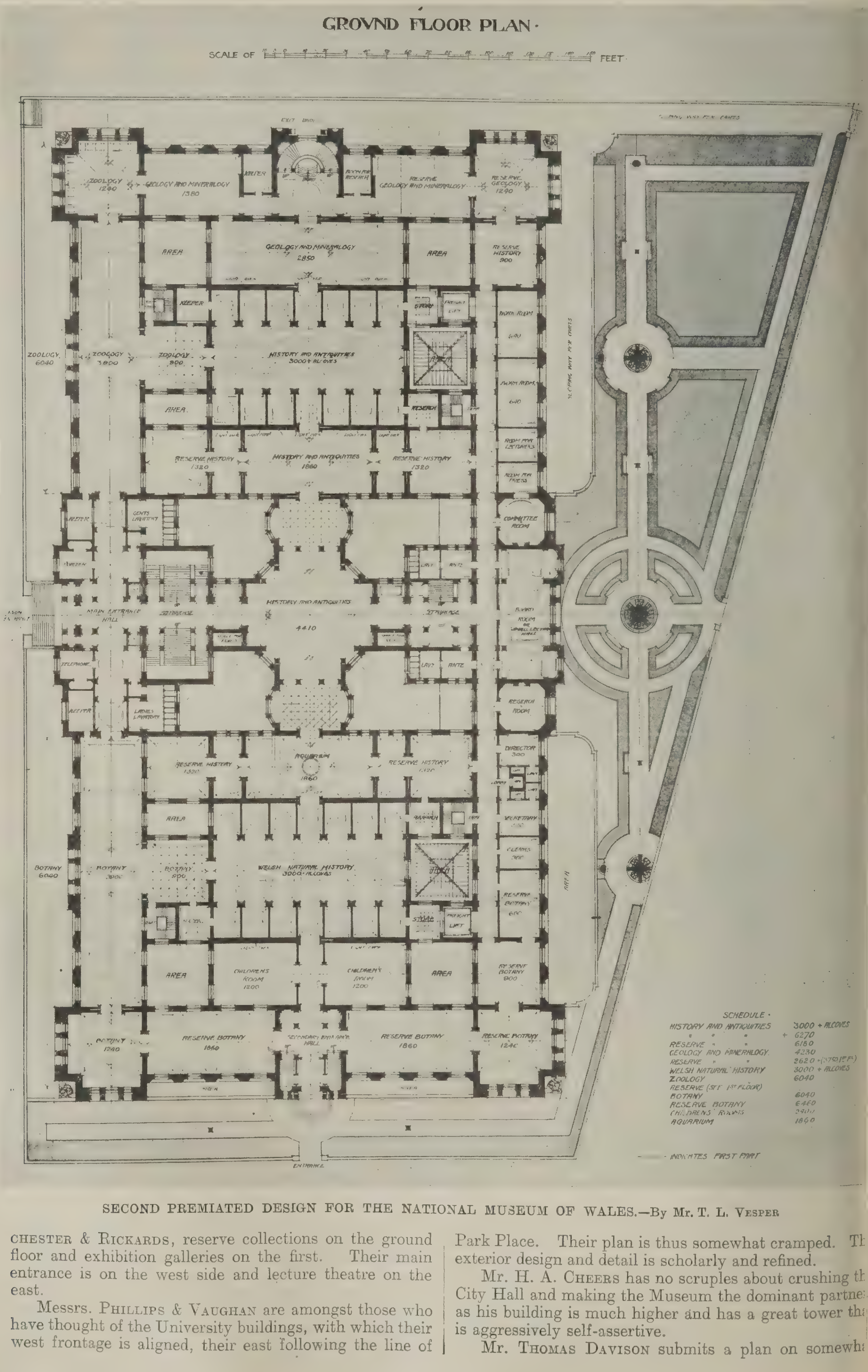
SELECTED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—Messrs. A. Dunbar Smith & Cecil C. Brewer, Architects.

and not near the exhibition galleries. Their outline follows the frontage of Park Place, with a semi-circular extension northward. The detail of their design is in the modern Franco-American feeling.

Messrs. Warwick & Hall have evolved an admirable plan with the main entrance on the south, and a succession of galleries on the longer axis with halls right and left, the reserve collections being outside. Most of their rooms are somewhat small, with the exception of a large central hall for the department of industries. The art department is located on the first floor. The exterior design is very good in itself, but does not behave modestly to the City Hall.

Messrs. Stockdale, Harrison & Sons and W. H. Thomson in some degree have come within measurable distance of success, as their reserve collections are near the exhibition galleries; but, like many other competitors, they have an aquarium suited only for stuffed fish. The queer shape of their lecture theatre is a blemish on their plan.

Messrs. Wills & Anderson adopt the arrangement we have noted in one of the schemes by Messrs. Lan



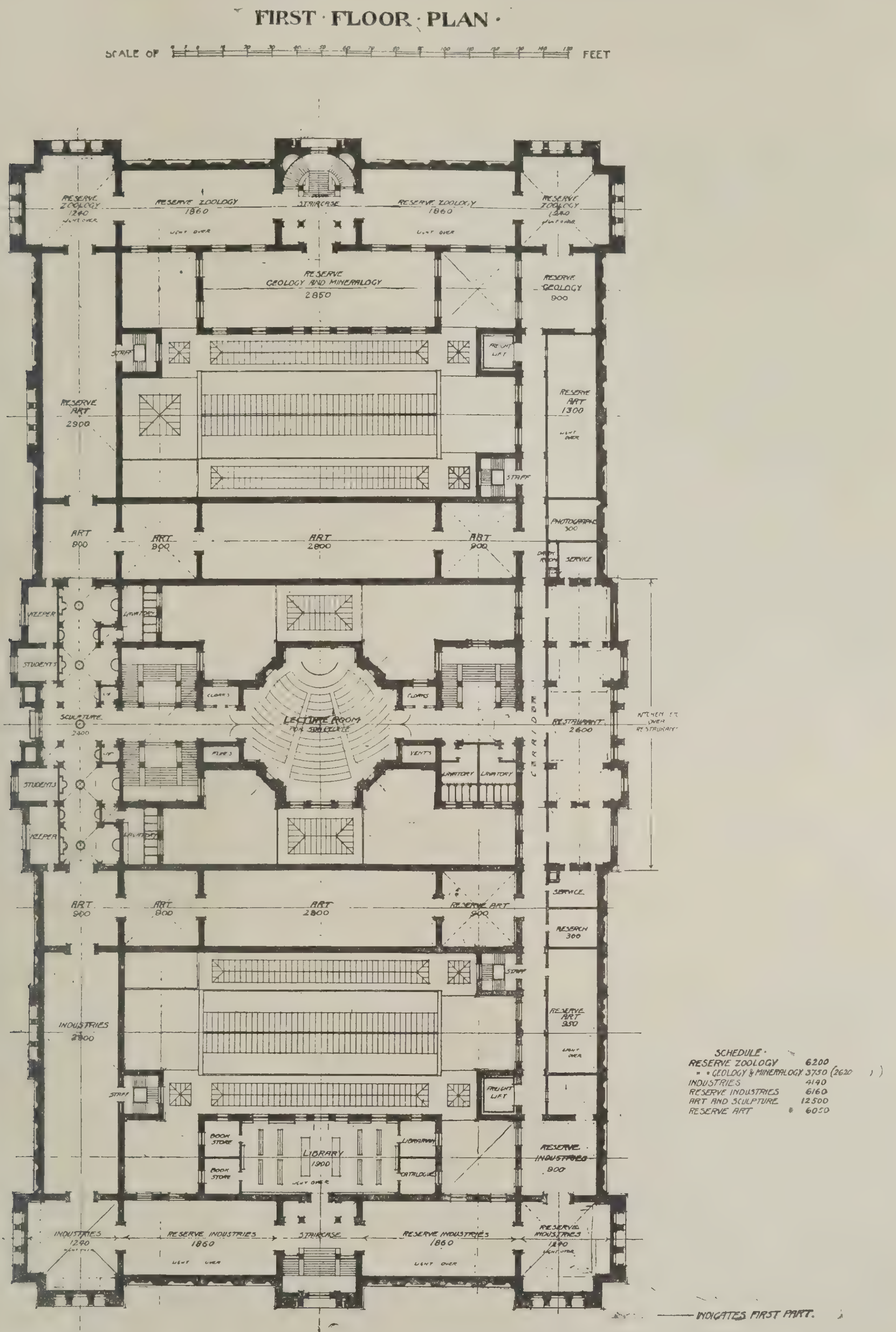
SECOND PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By Mr. T. L. Vesper

Chester & Rickards, reserve collections on the ground floor and exhibition galleries on the first. Their main entrance is on the west side and lecture theatre on the east.

Messrs. Phillips & Vaughan are amongst those who have thought of the University buildings, with which their west frontage is aligned, their east following the line of Park Place. Their plan is thus somewhat cramped. Tl exterior design and detail is scholarly and refined.

Mr. H. A. Cheers has no scruples about crushing th City Hall and making the Museum the dominant partne as his building is much higher and has a great tower tha is aggressively self-assertive.

Mr. Thomas Davison submits a plan on somewha



SECOND PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By Mr. T. L. Vesper.

similar lines to those of Messrs. Warwick & Hall—entrance on the south, with galleries on the main longer axis and two transverse axes; all the reserve collections adjoin the exhibition galleries, space being obtained by placing the departments of art and industries on the first floor. The design of the exterior, with a small central tower, is almost too modest.

Mr. A. N. Paterson has a notable feature that would be charming in summer time in the shape of an internal garden court on the eastern side, with a semi-circular loggia and exedrae for architecture and open air exhibits. He has adopted the unappreciated arrangement of exhibition galleries on the ground floor and reserve collections on the first.

Sir A. Brumwell Thomas and Mr. E. Montague Thomas have set back their west front to the line of University College. Their plan covers the whole area within their building lines, except for a few small well holes for the benefit of the basement. The provision of exhibition galleries on the ground floor and reserve collections on the first floor invalidates their plan, as it does that of many other competitors. An excellent feature of the external design is the western entrance with a loggia for sculpture.

Messrs. E. C. Frere & W. Wilcot have submitted a remarkably clever and original treatment of the elevations, even if not perhaps quite suitable for a museum, and certainly not in sympathy with the neighbouring buildings.

Messrs. Lovegrove & Papworth have cleverly arranged to produce a symmetrical plan with an extension beyond the rear frontage line of the City Hall that aligns with the University building. They have placed their exhibition galleries on the outside and reserve collections on the inside, but the latter seem to be a little short in area. The departments of art and industries are on the first floor. The authors have made a point of describing all parts of their plan in Welsh as well as in English.

Mr. Clyde Young's design is remarkable for the absence of external windows on the principal fronts, except to the stairs and entrance hall on the western side. A feature of the plan is the provision of two large internal garden courts, from which the galleries are lighted, and which also enable the author to dodge the crux of the basement by placing the board room, library, refreshment-room, and administration on the lower ground floor. The design is hopeless, because the reserve collections are on the first and second floors.

Mr. Matthew J. Dawson has some excellently drawn detail and sculpture and a striking plan, but the fact of the reserve collections being in a northern annexe and not closely connected with the exhibition galleries relegates excellent work to the limbo of failure.

Messrs. Jemmett & McCombie have indulged in a bit of town planning by suggesting future buildings to the north that should form a regular composition with the University and the Museum. In the plan of their own building the entrance is on the south, and there is a fountain court on the intersection of the transverse axis of the City Hall and the major axis of the Museum. Elevations and details are admirable, and the whole scheme a fine design, but the provision for study and research is separate from that for exhibition, which, for the nonce, is fatal.

Mr. Edgar Wood, like the authors of the selected design, has arranged his exhibition galleries in the middle and his reserve collection on the outside; but there is a lack of simplicity in his plan, not assisted by the provision of unnecessary galleries of communication.

Messrs. A. Marshall Mackenzie & Son send an effectively planned interior, with a western entrance leading to a central hall on the minor axis, and the alcoved galleries for Welsh natural history and history and antiquities left and right. Their scheme fails by the location of the reserve collections in a separate annexe.

Mr. William Haywood has devised a very effective external treatment by providing a number of open courts between projecting galleries, connected by open colonnades, but the galleries are small and reserve collections on upper floors.

Messrs. T. L. Dale, Alec Horsnell & Leslie Wilkinson have formed a syndicate to contribute a simple plan, but are marred by a wearisome and monotonous sequence of galleries with the reserve collection on the ground floor and the exhibition galleries on the first floor.

Messrs. Leeming & Leeming are, like many others, put hopelessly out of the running by the fact that their exhibition galleries are on the ground floor and their reserve collections on the first floor; but their plan is also vitiated by the provision of much corridor centrally and around the galleries. They submit a well-drawn detail and a good perspective showing a design thoroughly in sympathy with, and following closely that of the City Hall.

Mr. Theodore Fyfe has peculiar notions of the function of reserve collections in a museum, which he places in cupboards in the basement, euphemistically styled "lower ground floor," and in which they are mixed up with "storage" and work rooms. Other reserve rooms are in a rear building in three storeys. The main exhibition galleries are on the first floor.

Mr. Malcolm Stark provides in his plan an impressive feature of a great central court 154 feet by 90 feet, with a gallery round on the first floor. Two internal garde courts also give effectiveness. The disposition of th reserve collections is erratic; sometimes they adjoin th exhibition galleries of their departments, sometimes the are on different floors.

Messrs. Ashley & Newman send a nice plan symmetrically disposed about the minor axis, but the departments are not sufficiently distinct and often overlap, whils the reserve collections are scattered and for the most par separated from the exhibition galleries of their respectiv departments. Their detail is a fine drawing.

Mr. Frederick R. Hiorns has a good plan with th reserve collections mainly on the same floor with the exhibition galleries, but, like many others, he has an impossible aquarium, whilst his exterior is spoilt by a rathe ugly dome.

Mr. Martin S. Briggs has worked out an origin idea with his museum galleries arranged around two quad connected by a cross gallery with extensions at the rea forming a very effective exterior, but his exhibition ga leries are on the ground floor and his reserve collection on the first, so once again a good conception is hopelessl out of court.

Messrs. Honeyman, Keppie & Mackintosh have plan that approximates to that of the winners', wit entrances from the west on similar transverse axe principal entrance from the south, a central garden cour and reserve collections to some extent outside of and adjoi ing the exhibition galleries, but their plan suffers from lack of simplicity.

Mr. A. W. S. Cross has followed the wrong idea reserve collections on the ground floor and exhibiti galleries on the first floor, whilst his galleries in the cent of courtyards spoil these, and are badly lighted for t reserve collections in the departments of industries a zoology and botany. His exterior is quiet and dignifi and detail well drawn.

The syndicate formed by Mr. Henry Tanner, Jun Mr. F. D. Clapham, and Mr. T. F. Green has adopt the idea of a western entrance with a colonnaded logg that we have noted before. Whilst some of the reser collections adjoin the public galleries, in other cases t two constituent parts of departments are separated a sometimes far apart on different floors.

Another syndicate, Mr. Macartney, Mr. Halley, a Mr. Bacon, make a feature in plan of a grand central h for sculpture approached from a western entrance. Mo departments are on the ground floor, art and industri being placed on the first. Whilst some reserve collectio are connected with their exhibition galleries others a separated. Externally an imposing colonnade employed with detached columns on the south and we and attached on the northern façade.

Mr. Sydney K. Greenslade is another competit with a western entrance leading to a grand sculpture h and art gallery, but in his case also much fine design a labour is fruitless because the reserve collections are the ground floor and the public galleries on the first flo

Mr. Robert Atkinson keeps his main block within t compass of the Law Courts, with an extension having axis in line with that of the road behind the City Ha and with an entrance thereon leading to the lectu theatre, board-room, and administration. The ma entrance to the Museum proper is from the south, t public galleries being on the inside and the reserve c lections outside, with the departments of industries a art with their reserves on the first floor. The exterior well designed in a Franco-Grec manner.

Mr. Ernest E. Morgan aligns his plan with frontages of the City Hall and the University buildi as well as with the Park Place frontage. With a weste entrance he has arranged the public galleries in the cen and the reserve collections around, but in the case of department of history and antiquities, the location of exhibition galleries on the first floor and the reserve c lections on the ground floor mars an otherwise good pl The exterior treatment is good and well shown in perspective.

Messrs. Hall, Jones & Cummings have adopted the idea of a south entrance and long axial corridor with branches leading to galleries, not the best way of planning a museum, and moreover they have committed the *faux pas* of placing reserve collections on the ground floor and exhibition galleries on the first, as so many others have done.

Mr. F. Radford Smith has achieved the feat of restricting the Museum to the lines of the Law Courts, but only by the inadmissible device of putting reserve collections on the lower ground floor, alias basement.

Mr. A. Jessop Hardwick sends a plan of some merit with a lecture-hall of considerable architectural pretension, but with a great dome that would be bad acoustically. His reserve collections are arranged in a too haphazard manner.

Messrs. D. Robertson & W. J. Anderson have submitted a plan which contains the good feature of reserve collections adjoining the exhibition galleries, but they have indulged in too much corridor, and their plan lacks coherence.

Messrs. Lovell & Bulman contribute a simple plan that fails by the location of the reserve collections for the most part on upper floors.

We understand that many of the designs submitted will be exhibited in London at the rooms of the Architectural Bureau, where no doubt they will be visited by many who will take advantage of the opportunity to study a very remarkable display of modern British architectural designs.

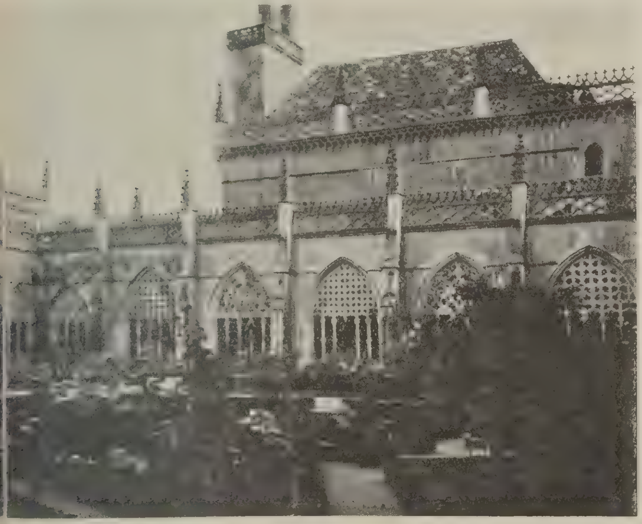
## CHURCHES AND CLOISTERS IN PORTUGAL.*

*(Concluded from last week.)*

### *Batalha.*

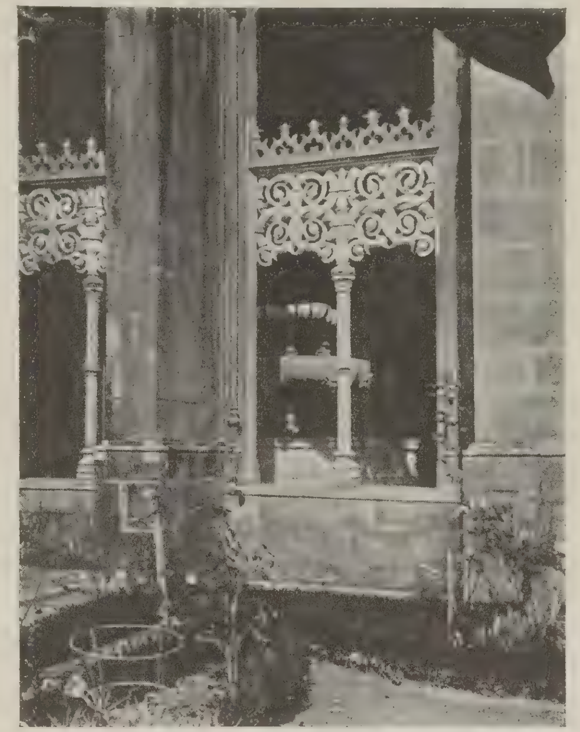
King Edward's son and successor, Alfonso V., built the north-western cloister, which we will visit later, but probably did little, if anything, to the eastern chapels. When King Manuel came to the throne in 1495 he carried on the work there and built the great western portal and the pateo or vaulted hall between the octagon and the church. He also constructed the vaults above the chapels surrounding the octagon, or most of them, and carried up the eight huge piers 80 to 90 feet high which rise above the rest of the structure.

But when we see the great west portal we feel transported to the Arabian Nights. This portal is about 17 feet in clear width and 28 feet high to the spring of the arch. No verbal description can convey what a remarkable piece of work it is.



BATALHA—ROYAL CLOISTER, LOOKING NORTH-EAST.

King Manuel died in 1521, leaving the work unfinished, and so it remains to the present day, except that some work above the great portal was done in 1553 when Renaissance feeling prevailed. It is said that the then king did not like it, and stopped the work. No one knows how it was intended to complete this wonderful building, or how it was proposed to connect it, if at all, with the church. It is quite cut off from the church, and the only access is by a quite unpretentious doorway at the north end of the pateo. Murphy gives us his idea of how the building ought to have been completed.



BATALHA—DETAIL OF TRACERY OF FOUNTAIN HOUSE, ROYAL CLOISTER.

The tracery of the great west window of the nave of the church, completely filling it (and indeed the tracery throughout the church), must not be judged by our Northern standards. The sun shines hotly in Portugal, and shade is a desideratum.

Now we come to the Royal cloister on the north side of the church, placed there for shade, no doubt, 182 feet square, including the walks, 17½ feet wide. Here again we have a close network of tracery to exclude rather than to admit the light.

BUSSACO HOTEL.

This cloister was built by the founder, John I., and may have had traceried windows originally, or may only have had openings awaiting tracery. In any case, at the same time as King Manuel was busy with his remarkable work at the Çapellas Imperfeitas he executed the tracery now existing. Here again no description will convey to your minds the richness and elaboration of the work. Most picturesque is the lavatory or fountain house in the north-west corner. Externally the angle turret with its plain surfaces acts as a foil for the elaborate transom-like tracery inserted by Manuel half-way up the tall and narrow lights.

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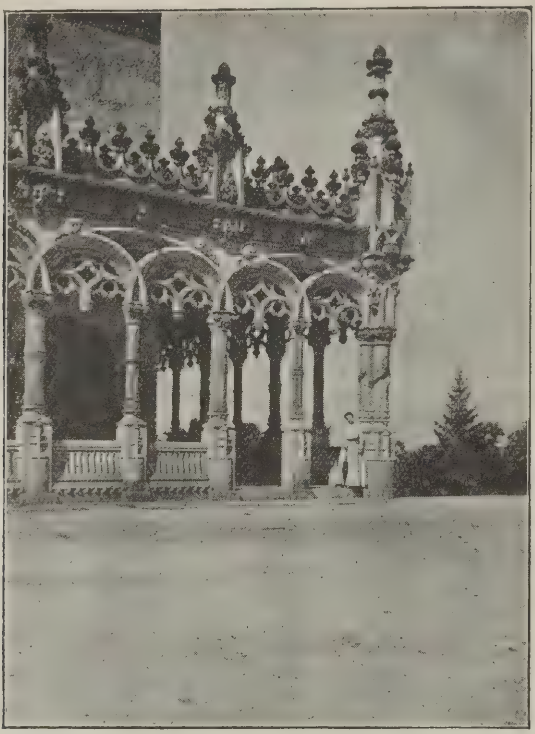
* A paper read before the Northern Architectural Association, on March 2, by Mr. Joseph Oswald, F.R.I.B.A.

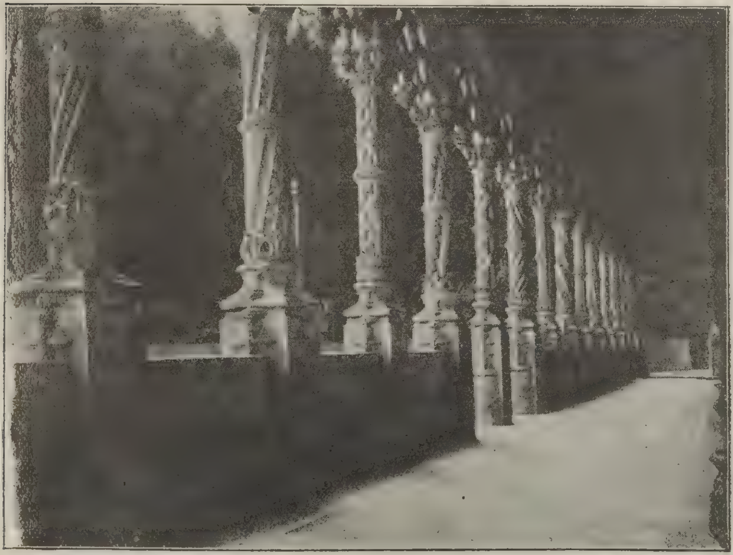


BUSSACO HOTEL—CORNER OF VERANDAH.

In the usual position on the east side of the Royal cloister is the chapter-house, 63 feet square, covered by a vault rising to a height of 43 feet without intermediate support—a bold achievement.

Murphy gives a very good section of it. It is not of lofty pitch, and yet it has withstood earthquakes that damaged other parts of the buildings from time to time.

In the south-east corner of the chapter-house the corbel from which the vaulting springs is carved to represent a man. It is evidently a portrait and said to be the architect.



BUSSACO HOTEL—INTERIOR OF VERANDAH.

To the north of the Royal cloister is another smaller and simpler cloister 143 feet square, including the walks, built by Alfonso V., which one would think by appearance to be much earlier in date than it really is. The upper storey is a later addition. To the east stood two other cloisters, destroyed by the French in 1810.

The cloister courts are cultivated as rose gardens, and the foliage and flowers, framed in by buildings gleaming like old ivory against the deep blue sky is a sight not to be forgotten. I have seen many beautiful cloisters in France and Italy, but the Royal cloister at Batalha excels them all as a picture.

Since the suppression of the monastery in 1834 the church and cloisters have been maintained by the Government as a national monument, and it is delightful to see in what excellent condition they are kept. Portugal is not a wealthy country, and only about 450*l.* a year is available for the purpose. One might wish that even less money were spent in supplying missing features, as the architects in charge appear to have a mania for cresting walls with pierced stone parapets and for filling the windows with hideous coloured glass set in wooden fretwork. These are the only blemishes due to the present generation.

There is a humble parish church not far from the abbey where one sees in the west door the influence of its prouder neighbour. The detail is very refined, partly Renaissance, with the Cross of the Order of Christ and the armillary sphere, showing it to be the work of King Manuel's time.

My paper is now finished, but I feel I ought to mention the hotel at Bussaco. This has been quite recently built (in fact, building is still going on) in the revived Manueline style, which appears to appeal to the Portuguese taste of the present day, as I saw a fine mansion in course of erection at Cintra, near Lisbon, in the same ornate style. The hotel shows the traditional clumsiness of outline and elaboration of detail, the execution of the latter proving that the right hand of the Portuguese carver of to-day has not lost the cunning of his sixteenth-century ancestors.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

At a general meeting held on Thursday, March 17, Mr. Percy Robinson, F.R.I.B.A., occupying the chair, the election of the officers for the forthcoming session took place, the following gentlemen being appointed to the several offices:—

As president, Mr. S. D. Kitson, M.A.; vice-presidents, Mr. R. P. Oglesby and Mr. A. E. Kirk, A.R.I.B.A.; hon. treasurer, Mr. R. Fielding Farrar, A.R.I.B.A.; hon. librarian, Mr. Fredk. Musto, A.R.I.B.A.; hon. secretary, Mr. R. W. Thorp, A.R.I.B.A.; to the Council, Mr. C. B. Howdill, A.R.I.B.A., Mr. J. F. Walsh, Mr. G. F. Bowman, Mr. H. A. Chapman, F.R.I.B.A., Mr. J. C. Proctor, A.R.I.B.A., and as Associate member, Mr. W. Whitehead, A.R.I.B.A.

In proposing the election Mr. W. H. Thorp, F.R.I.B.A., acknowledged the Society's indebtedness to Mr. Percy Robinson, the retiring President, who, he said, had done yeoman service on its behalf, and whose untiring efforts towards the furtherance of its aims were appreciated by every member, sentiments which were endorsed by Mr. H. S. Chorley, M.A., who seconded the proposal.

Mr. Kitson then read his paper on the "Life and Work of Carr of York," an architect who flourished during the eighteenth century, and to whose hand so many of the Yorkshire Georgian mansions owe their stolid simplicity. He is perhaps best known as responsible for the erection of Harewood House, where he came in contact with the Brothers Adam, a circumstance which considerably affected his subsequent work.

Commencing life as a mason with the traditions of several generations of mason forbears, he was one of the last links with the mediæval past, when the craftsmen had so great an influence on architectural development.

## ILLUSTRATIONS.

### PREMIATED DESIGNS FOR THE NATIONAL MUSEUM OF WALES.

All our illustrations this week are of the successful and premiated designs in the important competition for the National Museum of Wales. A critique on these designs appeared in our last week's issue, and is followed this week by a review of some of the more important unsuccessful designs.

The Royal Sanitary Institute have appointed Prof. Henry Adams, of the firm of Henry Adams & Son, and Dr. Louis C. Parkes as their representatives upon a joint committee which is being formed by the Institution of Heating and Ventilating Engineers to consider the question of legislation in connection with the ventilation of public buildings.

## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, March 18, in the premises at Tufton Street, Westminster, S.W., Mr. C. Wontner Smith (Vice-President) in the chair.

Mr. A. W. Lloyd was elected a member.

The Hon. Secretary announced that the sixth spring visit would take place on April 9 to Westminster Abbey, under the guidance of Professor Lethaby. As the visit was limited to twenty members, those wishing to attend were advised to make early application to the secretary for tickets.

Professor Beresford Pite read a paper, illustrated by photographs and lantern views, entitled—

### Filippo Brunelleschi and the Renaissance.

The period covered by the life of Filippo di Ser Brunelleschi, who was born at Florence in 1377, and died in 1446, seems to claim especially, as do so many similar epochs of a life-span, a pre-eminence in artistic and historic importance.

In England this is the term covered by the rapid recovery of national life after the terror of the black death of 1349, and is evidenced in the vigorous development, bold and inartistic though it was necessarily at first, of the so-called Perpendicular phase of Gothic architecture. Henry VII.'s Chapel here at Westminster belongs to a full century later than the youth of Brunelleschi, and enables us to judge by the measure of a hundred years the handicap of England in the evolution of Renaissance architecture.

The Eastern Roman Empire of Byzantium was still a fact, for Constantinople was not captured by the Turks until seven years after Brunelleschi's death, and the strange and short-lived fancy of reunited mediæval Christendom was enacted beneath Brunelleschi's unfinished dome in the cathedral of Florence, when, on July 6, 1440, Pope Eugenius IV., with all the Court of Rome, accompanied by the Emperor of the East, John Palæologus, and the chief prelates of the Eastern Church, with all the other bishops and prelates went to St. Maria del Fiore, which had been prepared, in the words of Vespasiano, "as beseemed such an occasion." The scene is thus described by the late Professor Eliot Norton. "The Pope, cardinals, and bishops of the Western Church took their places on the Gospel side, and on the other was the Emperor of Constantinople with all the Greek bishops and archbishops. The Pope sang a solemn mass. Cardinal Julian and Bessarion, Archbishop of Nicea, read from the pulpit in their respective tongues the act of union, and 'mutually embraced in the name and in the presence of their applauding brethren,' and before the multitude who crowded the vast nave of the cathedral and filled the space beneath its majestic dome. 'All the world,' says Vespasiano, 'had gathered in Florence to witness an act of such dignity.'"

Neither the parent dome of the Divine Wisdom at Constantinople or that later assertor of the claims of the West, the dome of St. Peter at Rome, have been more nearly the harbour and scene of so historic an achievement as that architectural wonder of Brunelleschi's enshrined on that "solemn day" of July.

But the reunion in the cathedral pulpit was but a pageant, its incompleteness typified, perhaps, by the yet unfinished building work. Ere the lantern had been placed upon the dome Constantinople had been taken by the Turks, the great empire of the East dissipated, and the Greek and Latin churches each suffering from the clay of earthly polities, left to pursue divergent courses; Santa Sophia to become a mosque, and St. Peter's to rear itself rather as a protest against Protestantism than as the shrine of an undivided Christendom. How ephemeral seem the deeper aspects of life when one gazes at the still-vivid illumination of the architect's mind throughout the lines and facts of such monumental tabernacles as Sta Sophia, Sta Maria del Fiore, and St. Peter's.

Symonds will describe for us better than anyone else the intellectual movement and spirit of the era of Brunelleschi, the Cinquecento literally beginning when, as we have seen, he would be twenty-three years of age, so that his prime came with the full tide of that most delightful and wonderful phase of early Renaissance art which included his rival Ghiberti, 1378-1455, and his attached intimates, Donatello, the incomparable sculptor, 1386-1466, and Luca della Robbia, whose delicious art and technical achievement so fascinates ourselves. To this group we have only to add the names of three contemporary painters to indicate the marvellous galaxy of Florentine artistic power:—Fra Angelico, 1387-1455; Masaccio 1400-1443; and Filippo Lippi, 1400-1469. Symonds says, "Speaking roughly, the half century between 1450-1500 may be termed the culminating point of the Renaissance," and we now quote him at length:—

"The Italians of the fourteenth century, more precocious than the other European races, were ripe for this emancipation of enslaved intelligence. In the classics they found the food which was required to nourish the new spirit, and a variety of circumstances, among which must be reckoned the pride of a nation boasting of its descent from the Populus Romanus, rendered them apt to fling aside the obstacles that had impeded the free action of the mind through many centuries.

"Petrarch not only set his countrymen upon the right method of studying the Latin classics, but he also derived the importance of recovering a knowledge of Greek literature. To this task Boccaccio addressed himself, and he was followed by numerous Italian enthusiasts, who visited Byzantium before its fall as the sacred city of a new revelation. The next step was to collect MSS., to hunt out, copy, and preserve the precious relics of the past. . . . Learning was then no mere pursuit of a special and recluse class. It was fashionable, and it was passionate, pervading all society with the fervour of romance. For a generation, nursed in decadent scholasticism and stereotyped theological formulæ, it was the fountain of renascent youth, beauty, and freedom, the shape in which the Helen of art and poetry appealed to the ravished eyes of mediæval Faustus. It was the resurrection of the mightiest spirits of the past. 'I go,' said Cyriac of Ancona, the indefatigable though uncritical explorer of antiquities—'I go to awake the dead.' This was the enthusiasm, this the vitalising faith, which made the work of scholarship in the fifteenth century so highly strung and ardent. . . .

"Fortunately for the unimpeded expansion of Italian art, little was brought to light of antique workmanship during the fourteenth and fifteenth centuries. The classical stimulus came to painters, sculptors, and architects chiefly through literature. Therefore there was narrow scope for imitation, and the right spirit of humanism displayed itself in a passionate study of perspective, nature, and the nude. Yet we find in the writings of Ghiberti and Alberti, we notice in the masterpieces of these men and their compeers, Brunelleschi and Donatello, how even in the fifteenth century the minds of artists were fascinated by what survived of classic grace and science. Gradually, as the race became penetrated with antique thought, the earlier Christian motives of the arts yielded to pagan subjects. Gothic architecture, which had always flourished feebly on an Italian soil, was supplanted by a hybrid Roman style. . . . The perfect plastic art of Italy, the pure art of the Cinquecento, however much imbued with the spirit of the classical revival, takes rank beside the poetry of Ariosto as a free, intelligent product of the Renaissance. That is to say, it is not so much an outcome of studies in antiquity as an exhibition of emancipated modern genius, fired and illuminated by the masterpieces of the past."

It would not be difficult to find material for an architectural biography of unusual interest to modern professional men in the career of Filippo Brunelleschi—competitions, committees, strikes, rivalries, the employment of models, and tactical manœuvres of various kinds would be provided such as insure a sympathetic ear; while force of personal character, versatility in sculpture and mechanics, and many points of contact with other branches of art and science would almost fill up the ideal and make Brunelleschi's story the true modern exemplar of an architectural student.

Brunelleschi has not lacked enthusiastic biographers. Vasari, who wrote in 1550, about 100 years after his death, as far removed as we are from Sir William Chambers, declares that he "was of such exalted genius that we may truly declare him to have been given us by Heaven for the purpose of imparting a new spirit to architecture, which for hundreds of years had been lost. But it pleased Heaven, the earth having been for so many years destitute of any distinguished mind and divine genius, that Filippo Brunelleschi should leave to the world the most noble, vast, and beautiful edifice that had ever been constructed in modern times, or even in those of the ancients."

It may be noted that Michel Angelo had only shortly before these words were published succeeded to the appointment of architect to St. Peter's, at Rome, which was not therefore in a position to rival this claim of Vasari for the Duomo at Florence.

The stormy rivalries of Florence during his lifetime point to the existence of strong appreciation of his talent, and we find that Cosimo de' Medici introduced him to Pope Eugenius IV. by an autograph testimonial, which runs as follows:—"I send your Holiness a man of such immense capacity that he would have confidence enough to turn the world back on its axis," a character which Brunelleschi did not abate by giving the Pope the not original Archimedean assurance:—"Let your Holiness only give me the point whereon I can fix my lever and I will then show what I can do." Truly, this architect would have succeeded in impressing a modern building committee.

Mons. Müntz (quoted in Blashfield and Hopkins's edition of Vasari) "calls Brunelleschi the Christopher Columbus of modern architecture, and asserts that he created it as a complete entity. A mathematician and engineer to the very centre of his being, the cupola of Florence is quite as much an engineering feat as an architectural performance; he left formulæ for the resolution of all problems, and sinned, if at all, by excess of sobriety and gravity." This reticence in architecture, by the way, is not characteristic of the modern engineering intellect. M. Müntz, "admitting that the Italian architects of the thirteenth and fourteenth centuries were not from the special point of view of architecture worthy to untie the shoes of a Brunelleschi, an Alberti, or a Bramante, nevertheless regrets the charming decorative fancies rejected for the three orders," but sums up by saying that "the Italians during the Gothic period had become a people of decorators, and that Brunelleschi made them again a people of architects." In the same work Michelet's opinion, in "Histoire de France," is given of him as one "who had the soul of Dante and his universal mind, but, ruled and guided by another Beatrice, the divine music of numbers and of visible rhythm. Through her he escaped all other temptations, even that of sculpture, whose virile fascination held him for a time. Perspective, mechanics, and all the varied arts of the engineer guided him along the road which he followed in continuous pursuit of that Urania who imitates upon earth the measure of Heaven and the eternity of the handiwork of God."

The brilliant and much-lamented William J. Anderson writes, in the introduction to "The Architecture of the Renaissance in Italy," that that movement "has been claimed as a result of the influence of literature and the study of the ancient manuscripts; but literature, while bolstering its decline and fall, had scarcely more influence on its origin than the writings of Virgil, Horace, Livy, and Ovid had on the architecture of the Augustan age they adorned. Originality has never been displayed to greater degree than by the architects of the Early Italian Renaissance, and considered in relation to the direction of all architectural effort for centuries, the interiors of San Lorenzo, the Badia at Fiesole, and Santo Spirito—all churches of Brunelleschi—are real works of genius. Brunelleschi, seeing the confusion and incoherency of the work of his time, went farther afield for his architectural technic to find it in the ancient principles of building, laying the foundation of a great revival by his masterly use of them, while fully satisfying immediate requirements. In Brunelleschi's resolution to acquire the Roman principles and to build upon them, we have just a distinctive circumstance unprecedented in the world's history, it may be, but in its audacity quite characteristic of the deeds of the time. In its own way it involved as much uncertainty as the voyage of Columbus, and was indicative of the same inquiring and unsatisfied tendency. But Brunelleschi, too, discovered a hidden world, and in the most brilliant way. His discovery was not fraught with the material consequences of that of the mariner, nor the scientific results of that of the astronomer; yet it has had an incalculable influence upon all forms of art production to this day. First in time, he was not second in intellect, in pertinacity, in achievement; and wherever the forms of art are understood and beloved, the genius of Brunelleschi will not fail of honour and renown."

To this, the view of a modern architect, we will add the testimony of Leon Battista Alberti, a young contemporary of Filippo Brunelleschi. Of all the men of the Renaissance Alberti is perhaps the most characteristic embodiment of its many-sided romanticism, by consent of his own, as well as of our time, the most extraordinary personality of the Cinquecento period. Man of letters, of arms and art, aristocrat and craftsman, dilettante and antiquarian, the father to all of us of the five orders of architecture. After a family exile of thirty years he returns with the revolution brought about by Cosimo de' Medici in 1434 to his native city, and dedicates his treatise on painting two years later to Brunelleschi with these words:—

"I have been accustomed both to wonder and to grieve that so many supreme and divine arts and sciences, which, alike from their works and from their history, we see to have abounded in those most highly-endowed ancients, were now lacking and almost utterly lost. And, indeed, hearing from many that this was the case, I thought that Nature, mistress of all things, now grown old and weary, even as she no longer brought forth giants, in likewise no longer produced geniuses such as those most ample and marvellous spirits which she produced in her youthful and more glorious days. But I, since I have been restored, after long exile in which I, Alberti, have grown old, to this our native land, that surpasseth all others in her adornment, I have recognised in many, but chiefly in thee, Philip, and in our near friend Donato, the sculptor, and in those other, Nencio (*i.e.*, Ghiberti) and Luca (*i.e.*, della Robbia) and Masaccio, genius capable for every praiseworthy work, not inferior to that of any ancient and famous master in the arts. Who is so unfeeling or so envious that he would not praise Pippo (*i.e.*, Brunelleschi), the architect, beholding here a structure so grand, lifted to the heavens, ample to cover with its shadow the whole Tuscan people, erected without aid of framework or multitude of timbers—a work of art, in truth, if I judge rightly, such as, deemed incredible in these days of ours, was neither conceived nor known by the ancients? But there will be another place for reciting thy praises and the virtue of our Donato, and of the others most dear to me by their ways. Do, then, only persevere in inventing, as thou dost from day to day, things by which thy marvellous genius shall acquire perpetual fame and name, and if, perchance, some leisure shall fall to thee, it will please me shouldest thou look over this little book of mine on painting, which, inscribed to thee, I have written in the Tuscan tongue."

How Time mocks, in its progress, at architectural doctrines professing to be grounded upon ethical principles, and makes merry over this confusing of things that differ, may appear from a passage in the preface to the late Mr. G. E. Street's book on the Gothic architecture of North Italy. It might be dangerous to make the quotation with such a purpose, lest the delicate and precious growth of earnestness in the breast of the architectural student might fade, were it not that Brunelleschi's achievements and personality provide us with a healthy corrective, and thus tend to clarify our judgment, enabling a well-directed enthusiasm to analyse the facts that underlie architectural fancy, instead of imagining that principles of moral action apply when but little else than the physical law of gravitation works. Mr. Street says:—

"It is impossible not to feel that the great and general interest in art created by a revival of true principles within the last few years is a subject of the greatest congratulation to all true artists. It was therefore with the desire to see how far these first principles were worked out by the architects of the Middle Ages in Italy that I undertook my journey. Let me say, too, at the same time," he continues, "that I started without either the intention or the desire to examine at all carefully the works of the Renaissance architects. I should wish also, I must confess, in all my studies of foreign architecture, to confine myself to those buildings in which there appear to me to be the germs at least of an art true and beautiful in itself, and of service to us in our attempt to improve our own work. It does not appear to me that the works of the Italian Renaissance architects really contain this. I see no reason for doubting that if we wish for a purer school of art we must either entirely forget their works, or remember them so far only as to take warning by their faults and failures."

Brunelleschi's practice will without doubt satisfy Mr. Street's genuine admiration for direct architectural expression, and his zeal for the pointed arch which, in the same book, he says is "not only the most beautiful, but at the same time incomparably the most convenient feature in construction which has ever been, or which, I firmly believe, ever can be invented." It may, with some ease to our feelings under the strain of Mr. Street's personality, be well to reflect that his enthusiasm for Mediævalism, and nothing else, was itself an antiquarian revivalism, though appearing as the only solvent of the latest problems of architecture, and that it issued through the hand of its enthusiastic devotee into beautiful and really original detail and decoration.

Further, with some deference, one may allege that the "furore" which Brunelleschi's compeers, whether brethren or employers' committees, experienced was the expression of a vigorous personality and a qualification with which more modern architects than himself have been equipped, necessary to the bringing to fruition of great architectural conceptions.

Individualism came to architecture with Brunelleschi, remained to us until Mr. Street, and is not apparently yet replaced by co-operative design and workmanship.

The works of Brunelleschi may be divided into two fairly distinct groups, and it may appear simple to do so, appraising the value of either to the Renaissance movement as follows:—(1) The completion of the Mediæval cathedral of

Florence by the addition of an octagonal-pointed vault involving architectural and mechanical problems of great importance; and (2) the revival and employment of architectural features, derived from classical studies, of great refinement and beauty, forming the first clearly-defined phase of a new Italian style, and of great subsequent influence and permanent artistic value.

The first, a special problem completing a Mediæval conception in a practical manner, came to its termination, and the second, the origination of a method of architecture with new detail and proportions, developed until it obtained a practically complete hold of the architecture of all civilised peoples. These divisions and estimates may be true, but are so only in part. Either achievement, whether in completing Mediævalism or initiating Classicism, might have been distinct and independent, but in Brunelleschi's case they fell within the grasp of one man, and were effected by a single course of events.

Mediæval architecture is primarily a system of construction achieving artistic expression by features developed and ornamentation arising out of the direct fulfilment of constructive or decorative purpose. The much bandied and battered phrases about truthful design and true principles of the Gothic revival illustrate, though they parody, the beautiful engineering of Gothic building. In the exercise of these predominating constructive principles Brunelleschi excelled by vaulting the great octagon of the Mediæval cathedral, the largest ever erected with a pointed arch, and thus brought its Gothic design to a harmonious completion. Renaissance architecture, on the other hand, assumes the Roman garb, whatever construction may underlie the form of the building, by an assumed civilisation putting a classic face upon any Philistine nakedness to mask its native or Gothic rudeness.

Brunelleschi was an enthusiast for this classic spirit also; he loved it, mastered it, employed it tentatively in the Pazzi Chapel, and as a revelation of new and wondrous gracefulness in the churches of San Spirito and San Lorenzo, while the Badia at Fiesole and the Loggia of the Innocenti Hospital show that he knew how to employ these artistic materials naturally in expressive construction. The development of a charming architecture, connecting and enshrining the swift movements of sculpture and decorative painting until the time of Michel Angelo a century later, is due to his initiative and school. It is difficult to imagine the trend of Renaissance art in the fifteenth century apart from the character imparted to it by its architectural features and principles. Difficult because setting aside the work of Brunelleschi we find no architectural leader sufficiently forceful to do more than gradually adulterate the weak Gothic of North Italy with sculpturesque feeling, as at Pisa and Siena, from local Romanesque sources. It is difficult to speculate upon what might have been in the absence of this genius who crystallised the problem of an age, but one may well doubt if Alberti, a quarter of a century afterwards, could have vaulted the octagon of the Duomo, and may certainly conclude that the long struggle and failure at St. Peter's at Rome of Bramante and his school evidence the fact that their hope to erect a dome similar to the Pantheon was foredoomed to failure. Michel Angelo, himself an enthusiastic Florentine, ultimately reverted both to Brunelleschi's pointed dome form and double arch.

The problem of the completion of the church of St. Mary of the Flower, that is, of the Lily, alike the Flower of Florence, and hence her name, and of Mary, was urgent just at that period in the early manhood of Brunelleschi, when, as with you, apparently insoluble enigmas exercise perhaps their greatest fascination over the mind. The new cathedral replaced the old historic church of the Santa Reparata, which resembled the beautiful San Miniato, the citizens in 1294 having determined upon its rebuilding. The foundation was laid upon the day of the Nativity of the Virgin, September 8, by the Papal Legate, to the honour of God and St. Mary of the Flower, and a tax on public expenditure, a graduated poll tax, or legacy duty, indulgences and pardons were ordained for the purposes of the work.

Arnolfo di Cambio was at this time architect to the Republic, and to him Florence owes the bulk of her fourteenth-century monuments. The Palazzo Vecchio and the Bargello, each with a wonderful belfry, the great church of Santa Croce, and the greater Duomo, were all buildings of his hands. Until Arnolfo's death in 1310 the works had continued in spite of much disturbance of civic peace by calamitous wars, seditions, and fire, the exile of Dante coming within this period.

The diminished revenues of the Commonwealth caused the suspension of works until 1331, and in 1334 Giotto, the painter, was appointed chief master of the work of the cathedral, and overseer of the other constructions of the Republic. He quickly began the design and erection of the Campanile, but died in two and a half years' time, when the tower was only about one-third of its height.

Taddeo Gaddi, his godson, having worked with Giotto for twenty-four years, was one of those to whom was intrusted the oversight of the works on the Campanile; this Gaddi is the celebrated painter, but he also was the architect of that Ponte Vecchio, with its charming street of shops, which has formed the fabric of Mr. Collcutt's pretty dream that London may some day also have a covered bridge across the Thames.

At the church of Sta Maria Novella, in the chapter-house, which became in 1567 the chapel of the Spanish colony, and therefore is now called the Spanish chapel, Taddeo Gaddi, in conjunction with Simone Memmi, executed one of the most complete and beautiful series of frescoes of the fourteenth century.

(*To be continued.*)

## WOOD-CARVING.*

WOOD-CARVING is an art with a past, and to-night I am chiefly concerned with an attempt to make the past live. To tell you, if I can, what I think the art has been, that you may the more easily form an idea of what it should be, for, in consequence of the peculiar organisation of industry at the present time, it rests with you more than with the craftsman to further that idea. You will forgive me if I liken the modern architect to an entirely new kind of organism whose parts have only a mystic connection.

By the exercise of strange and wonderful powers the directing intelligence sits in an office and attends to his profession (or is it an art?) whilst the several members are laying bricks or carving stone.

You will admit that in the early stages of its evolution the quality of the products of such an organism must of necessity be limited by the directing intelligence; the complexity of the organism tends to standardisation of processes, and it is that standardisation, when applied to wood-carving, against which I wish to protest to-night. A study of old work emphasises the fact that in the woodwork of to-day we are limited in ideas and in capabilities.

Compare the best or even the most extravagant of modern work with the work of the ancients of which we have descriptions, and I think you will agree with me that we show a distinct lack of the spirit of adventure in our treatment of wood. Take, for instance, these extracts from the annals of Thothmes III., 1500 B.C., describing plunder from conquered peoples:—

Plunder of Syria: Six large tables of ivory and kharub wood inlaid with gold and all precious stones.

Statues of the fallen chief, of ebony inlaid with gold.

Forty chariots inlaid with gold and silver and painted.

Take again the description of Solomon's Temple, which can be built up from references in the Bible. It was built of stone, lined with cedar, and consisted in the main of the holy place or nave—a rectangular chamber of 2 cubes of 24 feet, and the holy of holies (answering in plan to our chancel) of 1 cube of 24 feet. The porch at the east was lined with cedar, and the olive wood doors to the holy place were four-leaved, carved in low relief and overlaid with gold. The temple was a place of thick darkness, so there was a shallow vestibule with inner doors of cypress wood, carved as the outer doors. The holy place and the holy of holies were lined with cedar and the roof was of beams and planks. On the walls were carved cherubim, palm trees, and open flowers covered with gold fitted on. The ceiling was overlaid with gold and the cedar floor was plated with gold. Dividing the holy place from the holy of holies was a screen of six pillars, which reached half-way to the ceiling; double doors of olive wood filled the centre opening, and were carved and overlaid with gold. Above the screen were festoons of golden chains decorated with a hundred pomegranate flowers and garnished with precious stones for beauty. A curtain (the veil which was rent at the Crucifixion) hung over the screen on the outside and was blue, embroidered. Against the walls in the holy place were ten tables bearing ten seven-branched candlesticks, five of which burned by day and five by night. These were the only lights in a chamber 48 feet by 24 feet by 24 feet.

Think of the beauty of the golden chamber—the holy place, with its blue embroidered veil, in the dim candle light. Then again, think of the great statues of Athena Parthenos and the Olympian Zeus; wood overlaid with gold, ivory, and precious stones.

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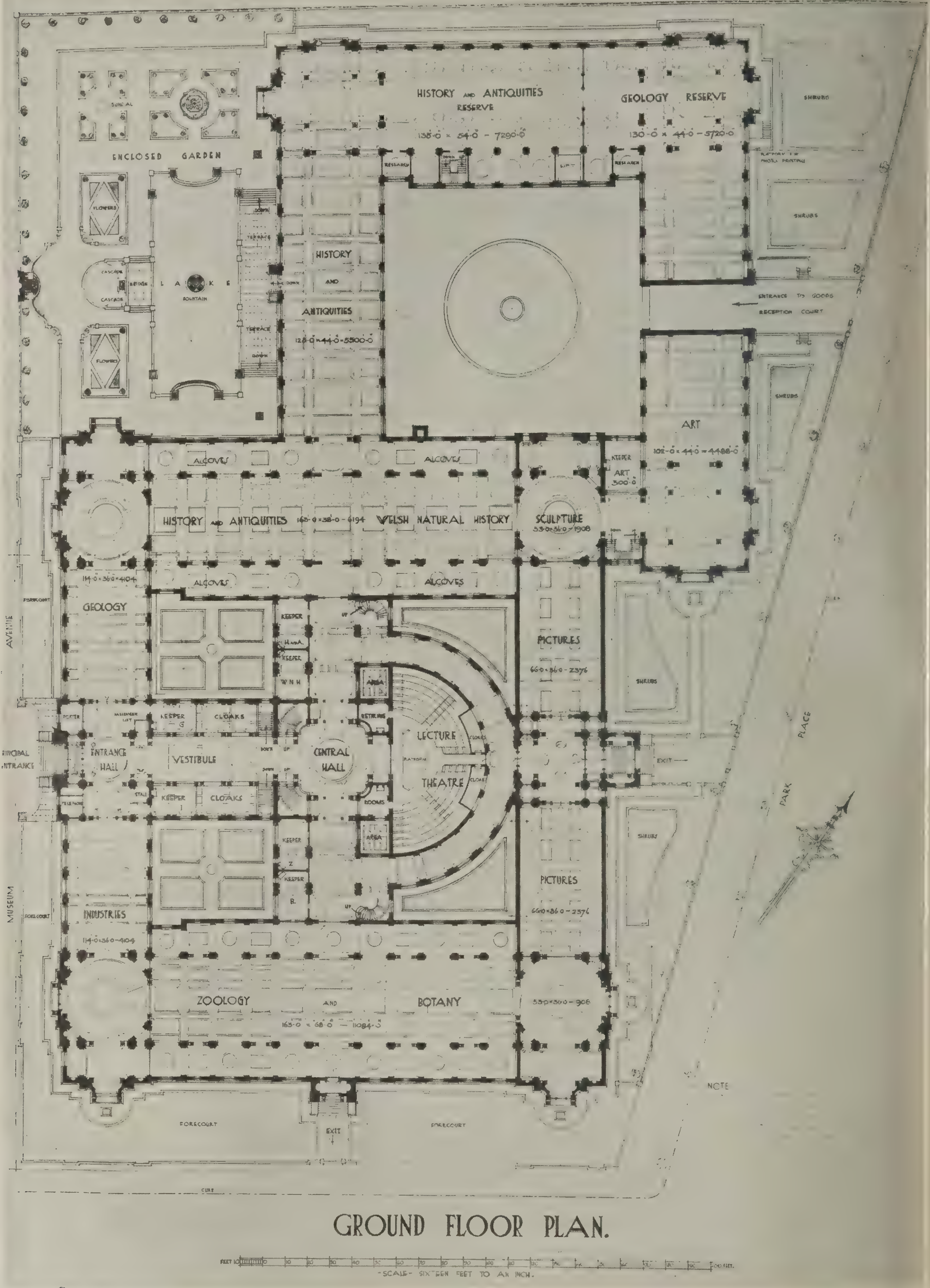
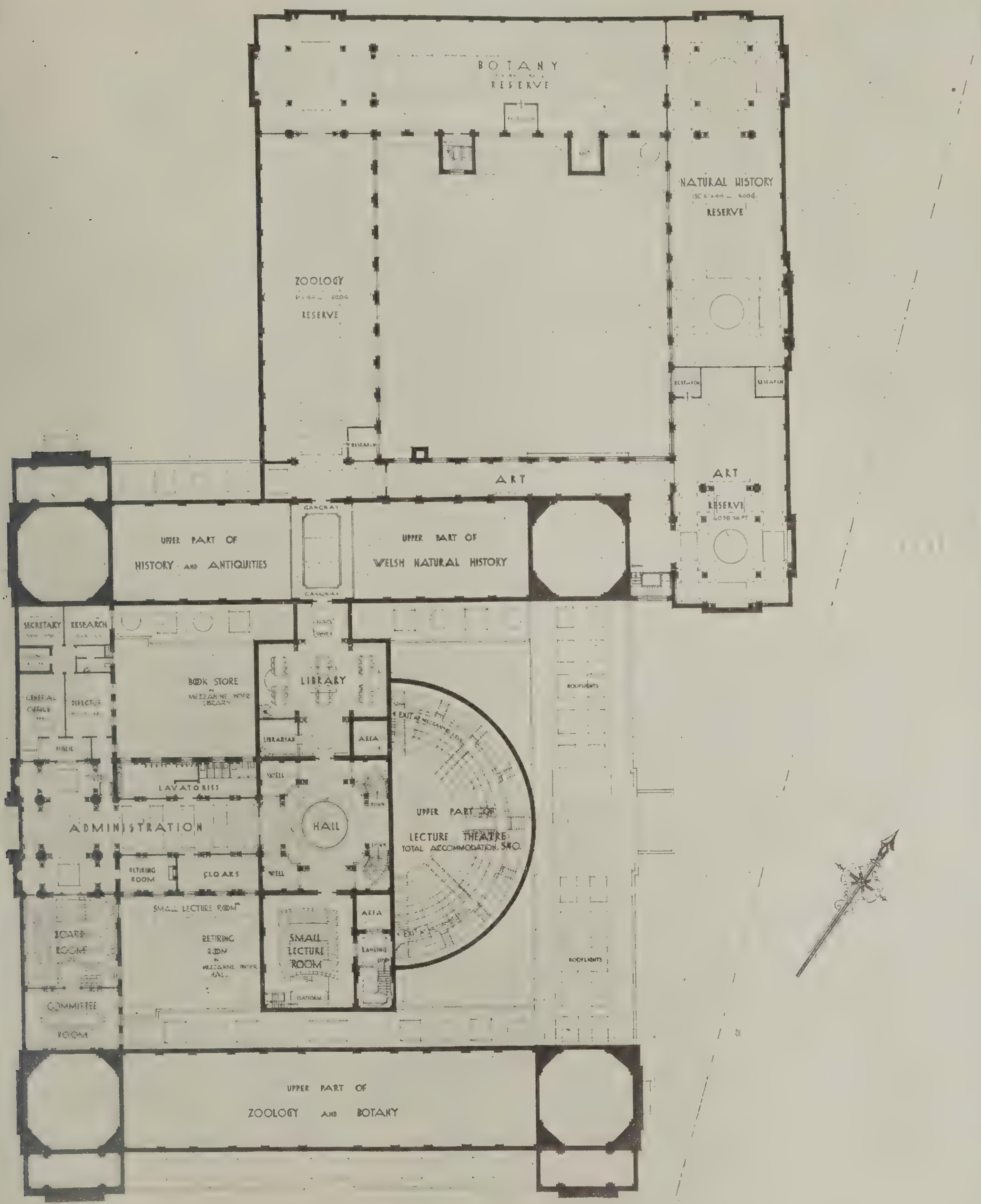
* A paper read before the Leicester and Leicestershire Society of Architects on March 11, by Mr. Joseph Armitage.



FOURTH PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By Messrs. David Milne & J. William Hepbur

because we are still under the influence of the Puritan idea that beauty is the enemy of the soul. You will remember the legend related by Heine to the effect that in 1433 a party of ecclesiastics walked in a grove near Basle wrangling over theological disputations; but suddenly in the midst of their abstract and dogmatical discussions they paused, transfixed before a linden tree, on which sat a nightingale, trilling and trolling the sweetest and tenderest strains. The learned m were ravished with delight. The glowing melodies of spri penetrated to their scholastic, musty, bookworm hearts, th souls awoke from the mouldy, wintry sleep, they looked one another in astonished ecstasy. But finally one of th made the sagacious remark that such things could not co of good, that the nightingale might be a devil, and that th



FIRST FLOOR PLAN.

FOURTH PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By MESSRS. DAVID MILNE & J. WILLIAM HEPBURN.

evil might be seeking through its sweet music to decoy them rom their pious conversations and to lure them to voluptuousess and similar pleasant sins, and then he began to exorcise, hereupon the bird replied, "Yes, I am an evil spirit!" and ew away laughing. But those who heard its song sickened hat very night, and soon after died.

People do not yet distinguish between fascination and beauty, and the artist is still somewhat of a bogey-man with loose morals, an entire misconception of art and beauty. Art, I take it, is an auxiliary of language in the transmission of ideas. By means of words man can only imperfectly express emotion, it is the function of art to give it more complete expression. Art, then, is an important means of communication between man and man, the universal language of the soul, and may be used basely to express base and ignoble feeling and emotion, to stir base passions; nobly to express the highest ideas and the most pure emotions. It can debase humanity or uplift it, and is technically good in so far as it succeeds in doing either—that is to say, the excellence of a piece of art qua art is to be judged by its success in conveying an idea or an emotion from the artist to the greatest number of his fellow-men. It follows, therefore, that its success or failure as art is largely dependent on its attractiveness, that is, good art must be either fascinating or beautiful. In practice, of course, immoral work (if I may use this unfortunate word) is fascinating, moral, beautiful. Bernard Shaw has said that beauty is a bye-product. We might add that fascination is consciously produced.

The range of expression open to the art of the wood-carver pure and simple is, of course, limited. His material is perishable and liable to fire. The wood-carver must, from the beginning, realise that he is dealing with a humble material; he must be content to be the architect's poor relation, happy if he can produce what Ruskin called a "pleasing roughness."

The great characteristic of wood is the grain; whether it be straight or twisted into fantastic knots, it puts difficulties in the way of perfectly smooth and accurate finish. Looking at most modern work one feels that the grain spoils the effect, or, to put it in another way, one feels that the work would look better in a perfectly homogeneous substance, such as cheese. One wonders why a man should attempt to produce such marvels of accuracy and smoothness in such a stubborn and wayward material. In mediæval work, on the contrary, one feels that the carver has conquered his material by kindness and judicious give and take, giving it a beauty that is almost human in its blending of imperfections into a harmonious whole.

Wood is distinctly the wrong material for subtleties of expression. But if the carver has something to say and is not merely roughing wood for a living, he can make us feel his delight in nature and in life, or amuse us with his jokes. Only by the crudest symbols can he tell us of the deeper things of life, and only then if he is of the élite. His beauty will grow round a core of symbolism, and will be so much the better if it is only a bye-product.

But how far is the carver justified in imitating nature? If he is to make us feel his delight in nature, ought he to stop short of exact imitation, give us not only the texture and colour but the smell of the flowers, if he can? What prevented the mediæval worker, with all his delight in nature, making his work naturalistic? Why is it that in all the great periods, side by side with great technical skill, there is a strict convention? The teaching of the tool is the text-book explanation, but the tool would lead one to damnation if one would let it. There is a constant temptation to greater and greater finish and skill in pure craftsmanship, the desire to excel as an executant. Again and again in history we see it struggling with some other power. Norman work developed towards naturalism until checked by the Cistercian reformation, which led to the weird convention of the thirteenth century, through which the naturalism of Decorated work gradually breaks, which again gradually hardens through Perpendicular to the convention of Late Perpendicular and the Early Renaissance, then to naturalism of Grinling Gibbons, back to convention of the eighteenth century, and so to the anarchy of to-day. Through it all there was a definite standard or tradition, development was fairly even, and behind it all there was the ideal, towards which it continually returned, the ideal of architectural fitness, the true sense of which was lost with the severance of the craftsman and the architect from the actual building. Now, when the parts of the work are executed in different parts of the country, in separate workshops, it is difficult to keep the units in proper relation, and our work suffers. The architect must paint his picture with ready mixed paint, or he must carefully mix his complete palette before starting the work. There can be little adjustment of values, and therefore less unity.

Professor Blomfield, in his lectures on the mistress Art, sees great possibilities in the further development of the architects' ego, as opposed to the commonwealth of building. He dreams of the architectural superman and warns his students against any inclination to find religious or moral sanction for the method of design which appeals most to their individual temperament—that excellence of intention does not to any extent atone for incompetent art, that architects have failed through a concentration on detail, and architecture is a personal art.

But surely if we are to have art at all, intention must be everything. The best individual art must be incompetent
The only art which approaches competence comes at the en
of a long chain of attempts at expression. The beginning o
true, artistic expression must be chaotic, incoherent, con
fused. The Iliad and the Odyssey are clear expressions, be
cause they were stories told and re-told and infused wit
new life at each telling until, when they become literature
they have a power and clearness of expression which is onl
possible as a result of this infusion to saturation point wit
the feeling and imagination of generations. Greek sculptur
of the fourth century would be miraculous if it were not th
result of generations of concentrated effort to realise th
divinity in material form.

Then there is one great and important distinction betwee
architecture and all the other arts, to which Professor Blom
field appears to give less than its proper value, and that is
we must live with the architecture which surrounds us, bu
we need not live with a bad picture or hear bad music o
poetry. The ideal of a great commonwealth of building a
least spreads the responsibility for bad architecture, keep
architecture in tune with contemporary life, makes it, in
deed, the expression of that life.

Then, again, the superman in architecture is self-destruc
tive. The Renaissance in architecture developed unifor
mity; Gothic, diversity.

If the crafts are dead, or, to put it another way, if the
have so far suppressed their traditions that they can b
used for the personal expression of every man who choose
to call himself an architect, there can be no architecture
If the parts are dead no amount of co-ordination can make
living whole. If the musicians are bad no amount of con
ducting can create good orchestral music.

To-night I have chosen my slides to illustrate existin
work which I consider shows most life, for that is, or shoul
be, the test to apply to all work. Does it add anything t
the sum of life, and if so, is life better for the addition? I
the expenditure of labour on this ornament or that decor
tion justified by the pleasure which will be derived from it-
the good it will do? That is the real political economy of ar
"Produce, produce, be it the infinitesimalest product, pr
duce," not matter, for that we can only re-arrange, bu
knowledge of life, for that is always waiting to be reveale
and its revelation is the artist's life work.

## GENERAL.

THE Royal Hibernian Academy held a specially convene
meeting last week, when the following resolutions wer
unanimously adopted:—In the lamented death of Sir Thoma
Drew, the Royal Hibernian Academy has to deplore the loss o
a president, who for the past ten years had devoted his bes
energies with indefatigable zeal and enthusiastic self-devotio
to its interests—and the members, individually, the loss of
kind and generous friend. In thus giving expression to thei
own sense of deprivation they desire to offer their most heart
felt sympathy to Lady Drew on her irreparable loss. Th
Royal Hibernian Academy desires to express its sense of th
loss it has sustained in the death of Mr. William M. Mitchell
R.H.A., who occupied the position of its treasurer and truste
for some years, and was otherwise a useful and energeti
member of the body, and directs that a message of sincere con
dolence be directed to Mrs. Mitchell and the members of hi
family.

A CIRCULAR has been issued setting out in detail the in
structions of the Local Government Board for the guidance o
their inspectors in cases where a public local inquiry is hel
on an appeal to which sec. 39 of the Housing and Town Plan
ning Act, 1909, applies. The inspector holding an inquiry ha
power to summon persons for examination on any matter pertaining to the subject matter of the inquiry. He can als
administer an oath, and to what extent he will avail himsel
of this power is left to his judgment, but it is enjoined tha
he should do so in all cases where the circumstances appea
to render such a course desirable. In place of the oath it is
open to him to require a witness to make and subscribe a
declaration of truth.

MR. CHARLES R. PEERS, M.A., F.S.A., has been appointed Inspector of Ancient Monuments. Mr. Peers was educated at Charterhouse and King's College, Cambridge. He took part 1 of the Classical Tripos in 1890, and part 2 Classical Archæology in 1891. Since 1905 he has been archæological editor of the Victoria County Histories and secretary of the Society of Antiquaries since 1908. He is an Assistant Commissioner of the Royal Commission on Ancient Monuments in England.

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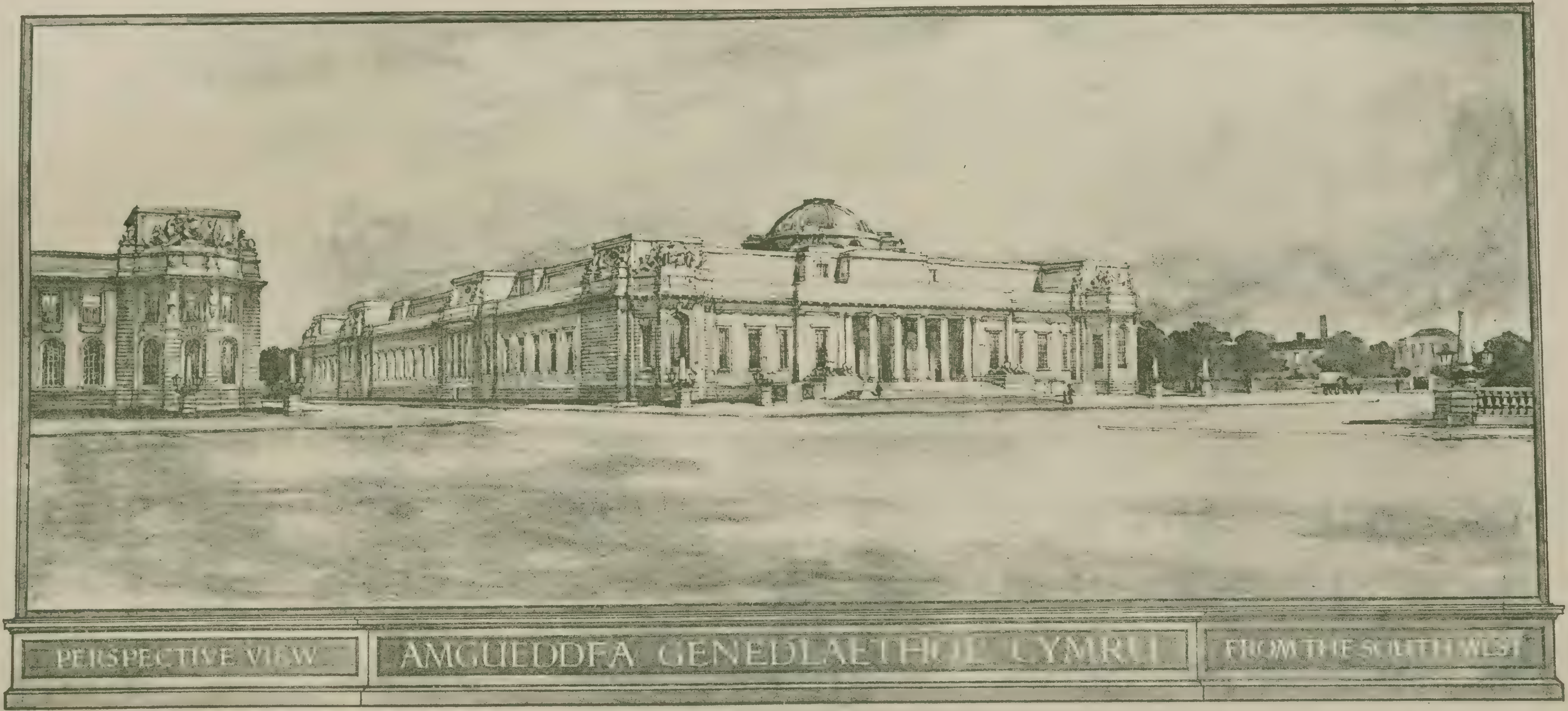
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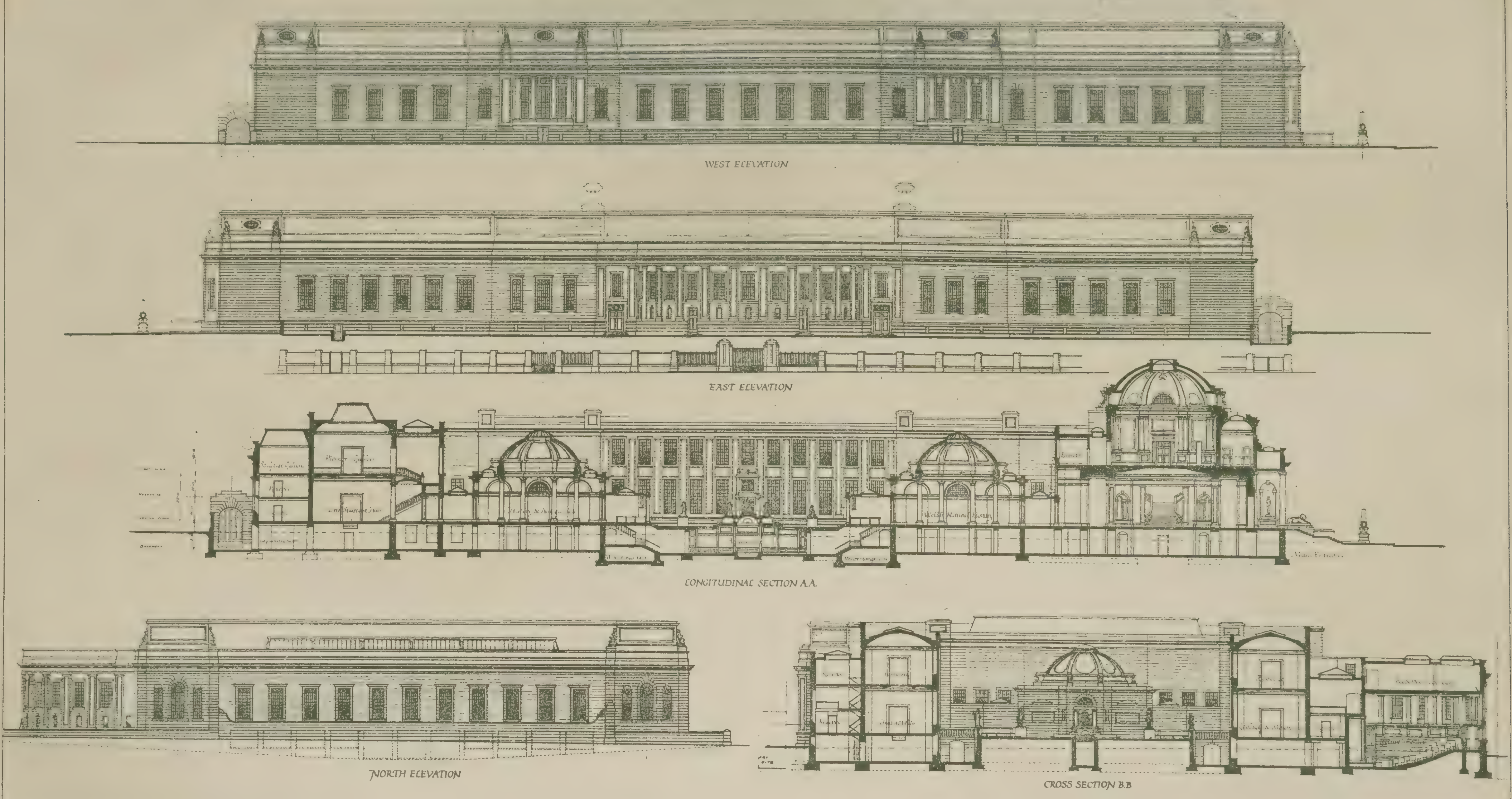
AMGUEDDFA GENEDLAETHOL CYMRU
FROM THE SOUTH WEST



WEST ELEVATION

EAST ELEVATION

LONGITUDINAL SECTION A.A.

NORTH ELEVATION

CROSS SECTION B.B.

PHOTO BY A. E. WALSHAM, 60 DOUGHTY STREET, W.C.

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SELECTED DESIGN FOR THE NATIONAL MUSEUM OF WALES.

Messrs. A. DUNBAR SMITH and CECIL C. BREWER, Architects.

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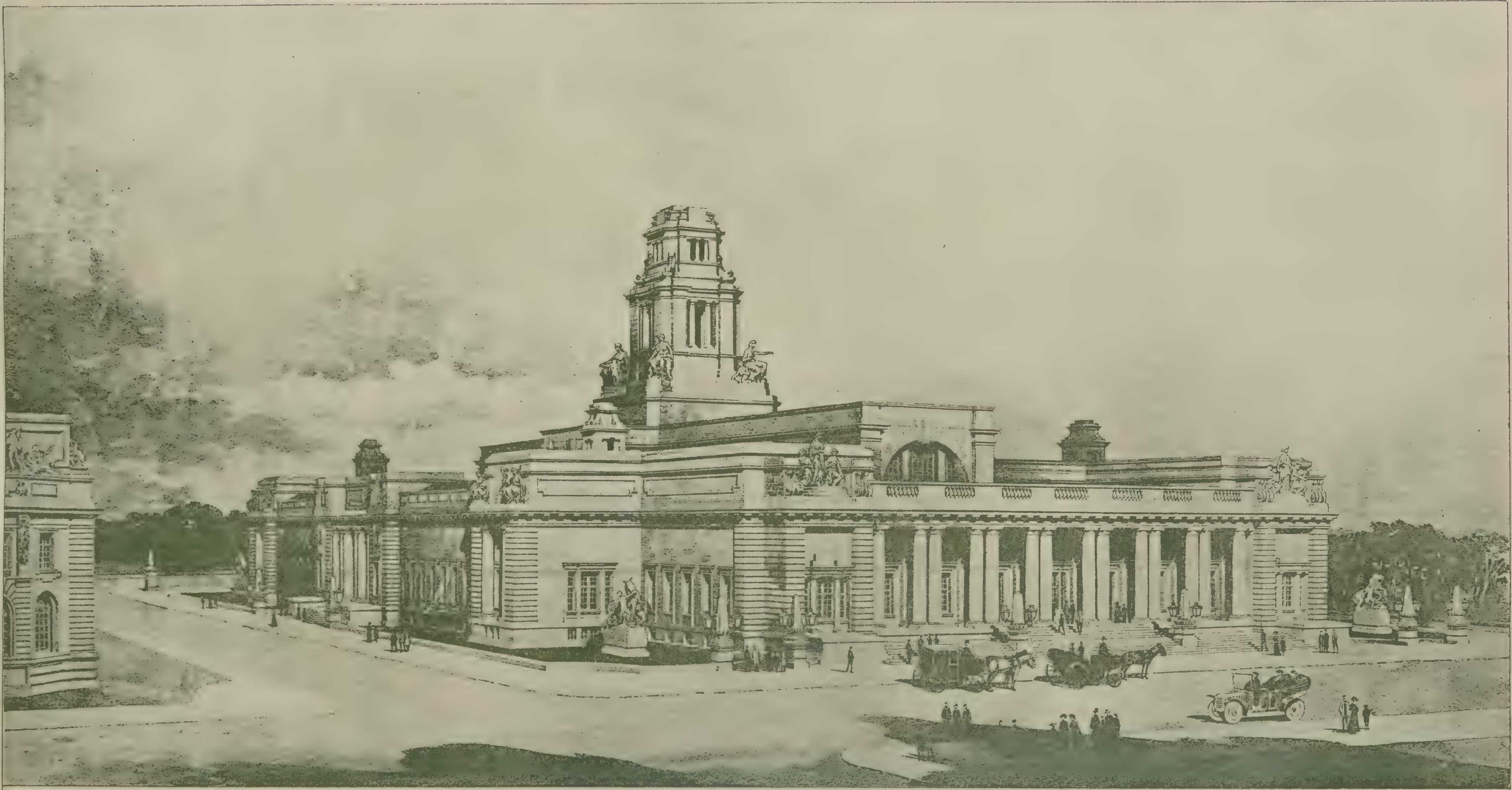

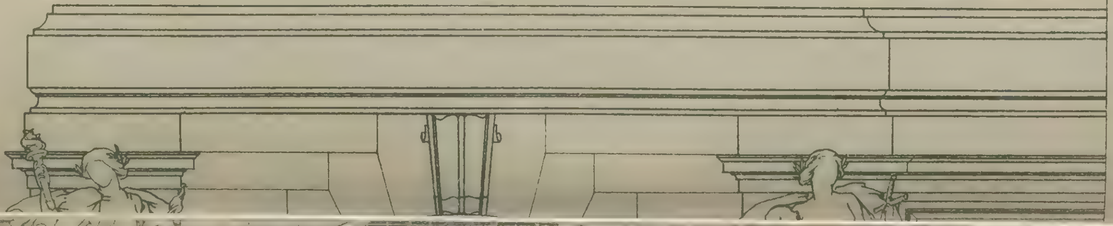

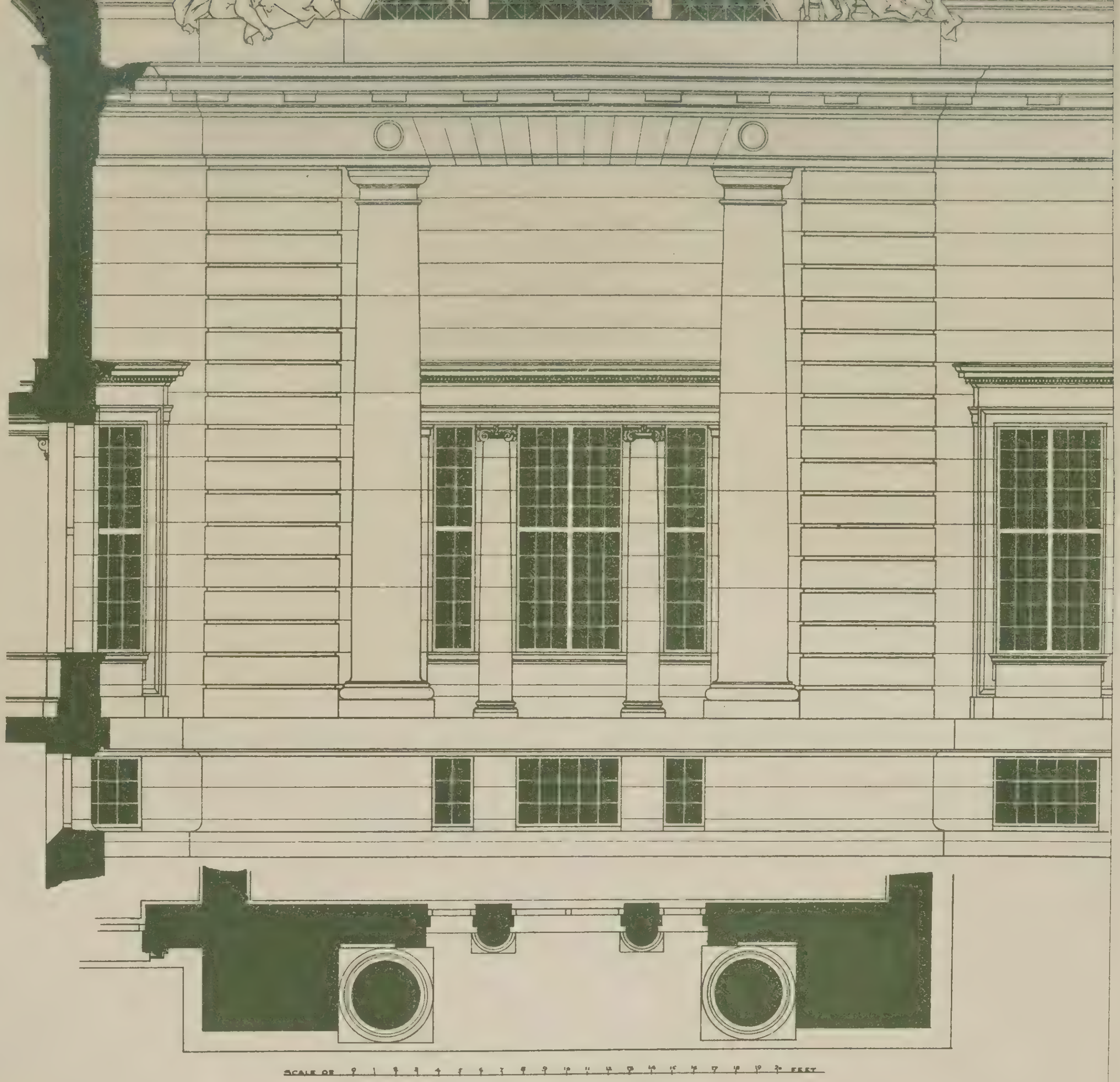
SCALE OF 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 FEET

DETAIL OF FRONT

PHOTO BY A. E. WALSHAM, 60 DOUGHTY STREET, W.C.

[illegible] STREET FETTER LANE E.C.

THIRD PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.

By Mr. HENRY T. HARE, F.R.I.B.A.

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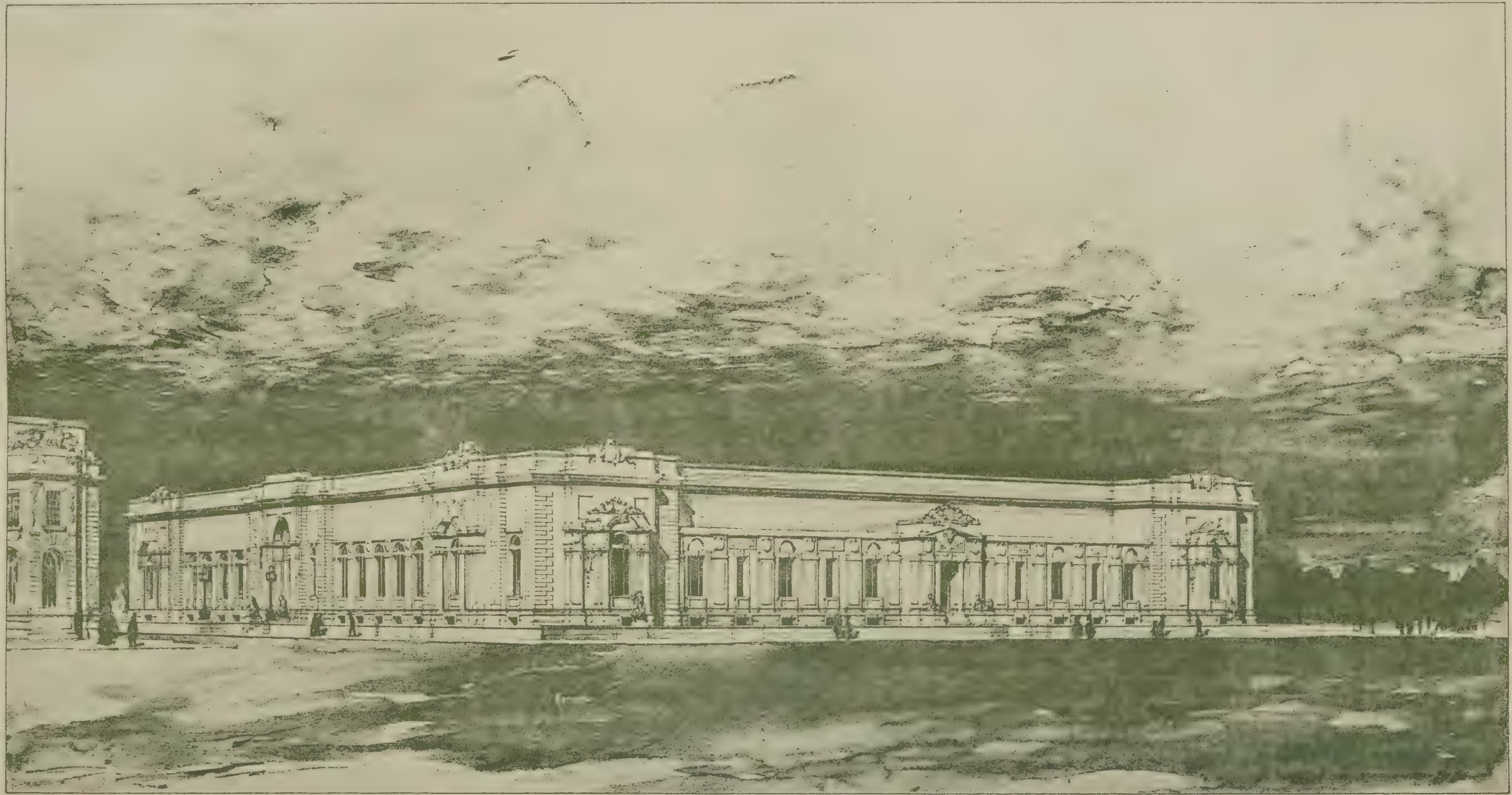

NATIONAL MUSEUM OF WALES.

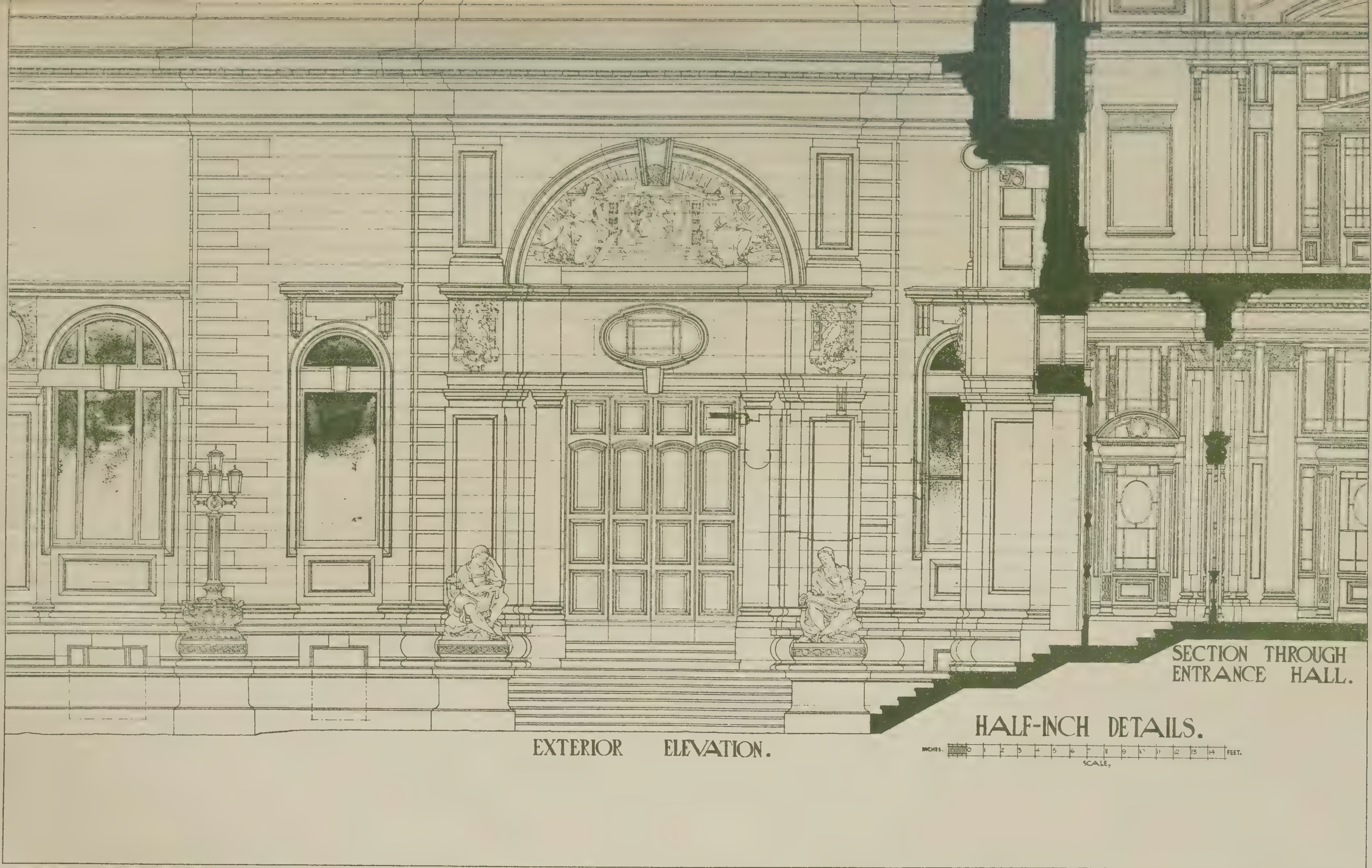
EXTERIOR ELEVATION.
SECTION THROUGH ENTRANCE HALL.
HALF-INCH DETAILS.
INCHES. 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 FEET.
SCALE.

PHOTO BY A. E. WALSHAM, 60 DOUGHTY STREET, W.C.

INK-PHOTO SPRAGUE & C° L° 4 & 5 EAST HARDING STREET FETTER LANE E.C.

FOURTH PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.

By Messrs. DAVID MILNE and J. WILLIAM HEPBURN.

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# The Architect.

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## FORTHCOMING EVENTS.

*Monday, April* 11.

Royal Society of Arts : Mr. A. B. Searle on "Modern Methods of Brickmaking." (Cantor Lecture 1.)

Surveyors' Institution : Paper on "The Report of the Royal Commission on the Poor Laws," by Mr. T. A. Dickson.

*Wednesday, April* 13.

Edinburgh Architectural Association : Annual Business Meeting ; President's Valedictory Address.

*Thursday, April* 14.

Society of Architects : Paper on "Construction Steelwork," by Mr. S. Bylander.

Illuminating Engineering Society : Continuation of Discussion on "The Measurement of Light and Illumination," Professor S. P. Thompson, D.Sc., F.R.S., in the chair.

Paint and Varnish Society : Paper on "Zinc Oxide," by Mr. Gaston Depierres, President.

*Friday, April* 15.

Society of Architects : Annual Dinner at the Holborn Restaurant.

## THE REMUNERATION OF ARCHITECTS.

NOW that the Schedule of Charges hitherto sanctioned by the Royal Institute of British Architects is under consideration for revision, if necessary, it is appropriate for all members of the Institute to give some thought to the question of the remuneration of architects for services rendered.

The basis of the present scale is that an architect should be paid a commission of 5 per cent. on the total cost of the works executed from his designs and under his superintendence, and although there is a proviso that for works of small amount or of exceptional character this rate of payment is not sufficient, the public who employ architects have become accustomed to regard the 5 per cent. commission as universal, except when, owing to special circumstances, it may be reduced.

It appears to us that an uniform and inflexible rate of remuneration at a fixed 5 per cent. on the cost of the building is radically wrong in principle.

In the first place, payment by a percentage on the cost suggests to the ordinary man that it is to the architect's interest to increase as far as he can the cost of the building. The feeling of this suggestion is very frequently expressed, and still more often lurking unexpressed operates to the prejudice of both architect and employer. When an architect suggests an expenditure of another 100*l.* which would improve the building, artistically or commercially, to a far greater value, the client is apt to be warped by the unexpressed idea that the architect makes the suggestion for the purpose of putting another five-pound note in his own pocket. Hence payment by percentage is prejudicial to the Art of Architecture, as well as to the status of a professional adviser, for the ordinary client does not realise that the first endeavour of every true architect is, as an artist, to make his building as beautiful as possible, and, as a professional man, to secure for his client the best possible value for his money.

If, for the sake of its convenience, a percentage on cost is taken as the basis of the architect's remuneration, it is still, in our opinion, obviously wrong in principle that this percentage should be uniform for all buildings and for all architects.

There can be, for example, no question that the amount of time, labour and skill required from an architect in the design and superintendence of a workhouse costing 200,000*l.* bears a very different proportion to the cost of the building to that required in the case of a house or village church costing 2,000*l.* Hence, if payment by percentage is adopted, there should be different rates for different types of building.

This fact is well recognised in Germany, where different rates obtain for different classes of buildings, and this is, we think, a reform that is very desirable in the Institute scale. Nor should the revision be confined to different classes of buildings. It should extend in some cases, at any rate, if not in all, to buildings of varying cost though of the same class. There can be no doubt, for example, that the services required from an architect in the case of a church costing 20,000*l.* are not ten times those necessary for one built for 2,000*l.*

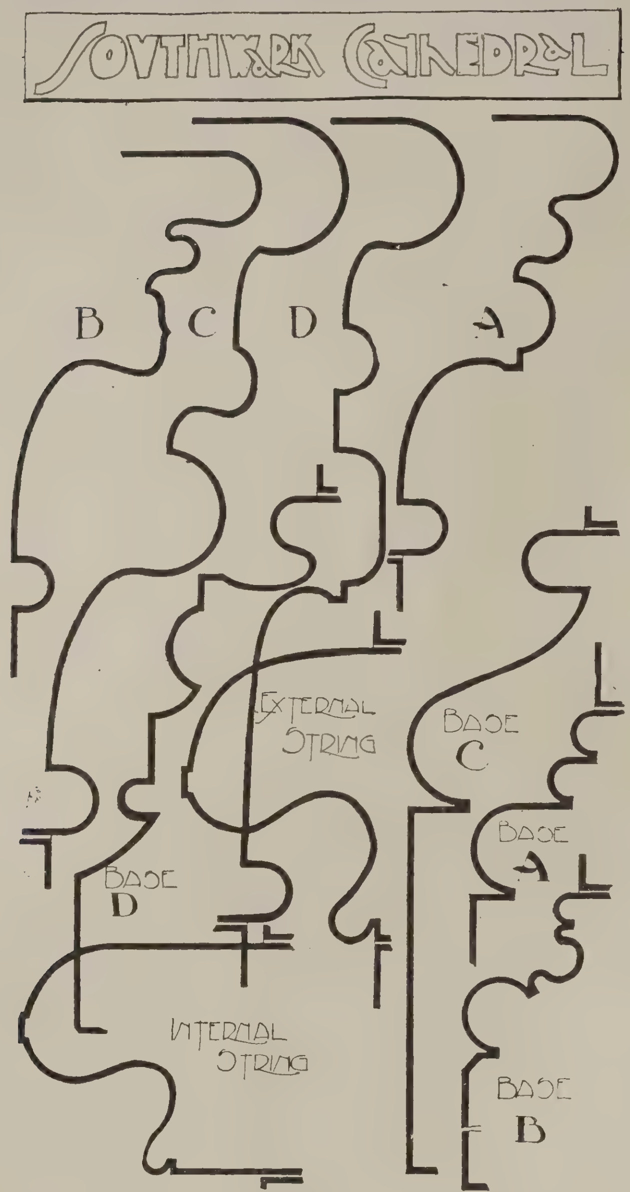
Again, the idea that all architects, from the newly-elected A.R.I.B.A. to the R.A., are properly paid at the same rate is one that can only be justified on the trade union principle of a living wage for every man and no more for the best. This is absolutely opposed to the practice of every other art or profession, except perhaps that of a solicitor, which is not quite on all fours with other professions, for a solicitor's business is very closely analogous to that of a contractor, in that a great portion of his work is done by moderately-skilled employés who only need the direction of a captain of industry.

The remuneration of a painter, a sculptor, a barrister, a physician, or a surgeon varies with his position and his ability in his calling. So should it be with architects. The architect who by his artistic power and ability has obtained the recognition of his merits by election as R.A. ought surely to receive higher remuneration for his exceptional powers than the young and inexperienced practitioner who has just put up his brass plate.

It might be said that the adoption of an uniform rate works out all right in practice, because if the public know that they can obtain the services of the R.A. at the same price as they would pay the A.R.I.B.A., the R.A. would get the offer of the most of the work, and could pick the jobs that would pay best, and by the help of an army of assistants, improvers, and pupils make a good thing out of it. But it is not to the advantage of the Art of Architecture that the R.A. should make a big income by the help of a large number of less able men as his employés. It would tend to better artistic work that the R.A. should make the same income with a less amount of building under his control, but receiving a larger portion of his personal attention.

There need be no fear that the public who employ architects would rebel against a system of higher fees for leading men. They cheerfully pay them for the leading K.C., the Harley Street specialist, the R.A. painter or sculptor, and why not for the R.A. architect?

The K.C. whose clerk will not receive a brief marked at less than a hundred guineas has more work than he wants, or can manage, whilst the junior who is ready to go into Court for a couple of guineas does not make enough to cover the rent of his chambers.



Drawn by Mr. REGINALD PYWELL.
"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

The R.A. who will not part with a specimen of his work for less than a thousand guineas sells as many pictures—at least in ordinarily prosperous times—as the man who will do a portrait for a ten-pound note.

The Harley Street specialist has his consulting-room occupied all the morning, whilst the man who runs a dispensary with advice free is usually on the look-out for a successor, fresh from the hospitals, who will buy his practice—save the mark!

The truth is that the public is always ready to buy the professional man or the artist at his own valuation, and in many cases the higher the price, the bigger the demand. We have seen an illustration of this recently in the United States, for our American *confrères* during the past year came to the conclusion that the 5 per cent. commission which, following English precedent, they had previously adopted, was under modern conditions insufficient, and they, in their annual Convention, decided to raise it to 6 per cent. As far as we are aware the American public have raised no protest or objection.

It is not possible for the employers of architects or other artists or professional men to estimate what expenditure of time, labour, and skill is entailed by the work done, and the public must therefore look to the profession itself to appraise the value of its services—to fix what the lawyers call the "quantum meruit."

Having pointed out the defects of the present system, it behoves us to suggest an alternative. As there should, in our opinion, be a varying scale of charges for differen classes of buildings as well as for different costs, the scal should prescribe a definite fee, not a percentage for eac description of building within a certain range of expendi ture—for example, churches under 2,000*l*. so much; fron 2,000*l*. to 3,000*l*. so much, and so on; another scale fo domestic work, for workhouses, and for the various othe possible classes, and a provision for payment by time.

To meet the desirability of seniors receiving highe remuneration than juniors the scale should be the max mum for members of the Institute who, by reason of the executed work and position, hold the front rank. The each member of the Institute should be allowed to fix th percentage of the maximum scale to which he conside his knowledge and ability entitle him, and should recei from the Council a certificate that in their opinio Mr. A. B. is entitled to payment at the rate of 90, 80, other percentage of the maximum scale. Members the Institute should then be advised to send to their clien a copy of the maximum scale and of their certificate fro the Council on receiving a commission for, or engageme of, their services. In this way a contract would acknowledged or implied, and the public would so realise that the percentage of the maximum scale wou indicate the standing of each architect, and would deci whether they desired cheapness or efficiency in ea particular instance.

## NOTES AND COMMENTS.

FROM an evidently inspired article in the *Times* we lea that the by-laws which have after much discussion be drafted and approved by the Royal Institute of Briti Architects have on Friday last received the sanction of t Privy Council, and therefore now become the law of t Institute. The article gives an epitome of the history the Royal Institute from the date of its first Chart in 1837 to the inception of the new class of Licentiat which the now-approved by-laws legalise. Attention drawn to the part that the Institute has taken since 18 in assisting with its advice in the drafting of "practica every piece of legislation affecting the public impro- ment and embellishment of towns and cities, includi the Town Planning Act of the last Parliament." our mind, the most pregnant statement in the article that "as soon as the Licentiate class is established t Institute proposes to apply to Parliament for an Act enable the public to distinguish between a properly qua- fied architect and a man who merely uses the title co- mercially, without having any trained aptitude for exercise of the art."

THE article being evidently inspired, as we have sa we may take it that the policy thus publicly put forw is recognised as the present policy of the Royal Institu and it therefore behoves all members of that body w agree with this policy to take care that their votes recorded at the approaching election for active support of the policy, and not for reactionaries or procrastinat of the proposed application to Parliament, howe exalted their position as successful exponents of the of architecture.

IT is of great importance that it should be as wid known as possible that the class of Licentiates can o be entered during the ensuing twelve months, and tha affords a means of entering the class of Fellows by p motion from that of Licentiates. The number of arc tects who at present are outside any professional b may be sure that it will not be long now before they find themselves obliged to inscribe their name or register and to give evidence of their right to do so. evidence will most easily be provided by membershi the Royal Institute of British Architects.

WE did not anticipate that the number of drawings should receive for the March subject in our Stude

Sketching and Measuring Club would be very large, as water-colour sketching is rather a novelty to many of our members, and we are pleased, therefore, to find that eleven drawings have been contributed. A review of these will be given in our next week's issue, and the name of the successful competitor for the monthly prize will be then announced.

The National Association of Master House Painters and Decorators of England and Wales has issued a leaflet drawing attention to the grave prejudice to the public health which arises from the practice of papering walls of dwelling-houses on the top of existing papers, and the equally dangerous practice, from a health point of view, of laying one coat of distemper upon another without first washing off the old colouring matter. The Association is, however, in error in stating that such practice is more likely to be prevalent in the case of poorer tenants, as under the new Housing and Town Planning Act local sanitary authorities have full power to require anything to be done to make a house sanitary when the rental value does not exceed a fixed figure.

*The Engineering Magazine*, in a series of articles on "The Industrial Applications of Reinforced Concrete," by Mr. M. M. Sloan, is giving some useful and interesting details of the application of this material to factory and mill construction.

In a letter to the *Times* anent the vandalistic tree-lopping in South London, Sir Aston Webb draws attention to the desirability of planting only such varieties of trees as may be expected to maintain their growth and natural form without the necessity of drastic lopping to counteract undue spreading and rapid growth. Unfortunately the most suitable class of trees for town planting are the planes, which are able to flourish in sooty atmospheres by reason of their habit of discarding their old bark, and so presenting a new surface whose pores are clean and unclogged. The planes are much given to spreading, and hence in town streets soon become excessively luxuriant. Perhaps the most beautiful examples to be found in the metropolis are those in the enclosure of Lincoln's Inn Fields, where they have had an opportunity of growing unchecked by the lopping which is almost unavoidable in a public street.

## THE NEW CLASS OF LICENTIATES, R.I.B.A.

The following letter, explanatory of the status, privileges and qualifications of the new class of Licentiates of the Royal Institute of British Architects, has been sent to the architectural societies allied to the Institute:—

Dear Sir,—We have the honour to invite the attention of your Society to an important development in the constitution of the Royal Institute of British Architects which has lately been sanctioned by the grant of a supplemental charter and new by-laws by His Majesty the King and the Privy Council.

A new class of members, having the chartered right to the designation of Licentiates of the R.I.B.A., has been created. This class is open to all practising architects of good standing who have attained the age of thirty years, and either (*a*) have been engaged as principals for at least five successive years in the practice of architecture, or (*b*) have been engaged for at least ten successive years in the practice or the study of architecture.

Candidates for this class are not required to pass an examination or to submit to election by the general body, but must satisfy the Council of the Royal Institute that they are fit and proper persons to be admitted to the class.

*Under the provisions of the supplemental charter of* 1908 *candidates for the class of Licentiates will only be admitted during the twelve months from March* 23, 1910, *to March* 23, 1911.

Under His Majesty's charter any Licentiate who is eligible as a Fellow may at any time before December 31, 1920, be admitted for nomination to the class of Fellows when he has passed an examination to be prescribed by the Council.

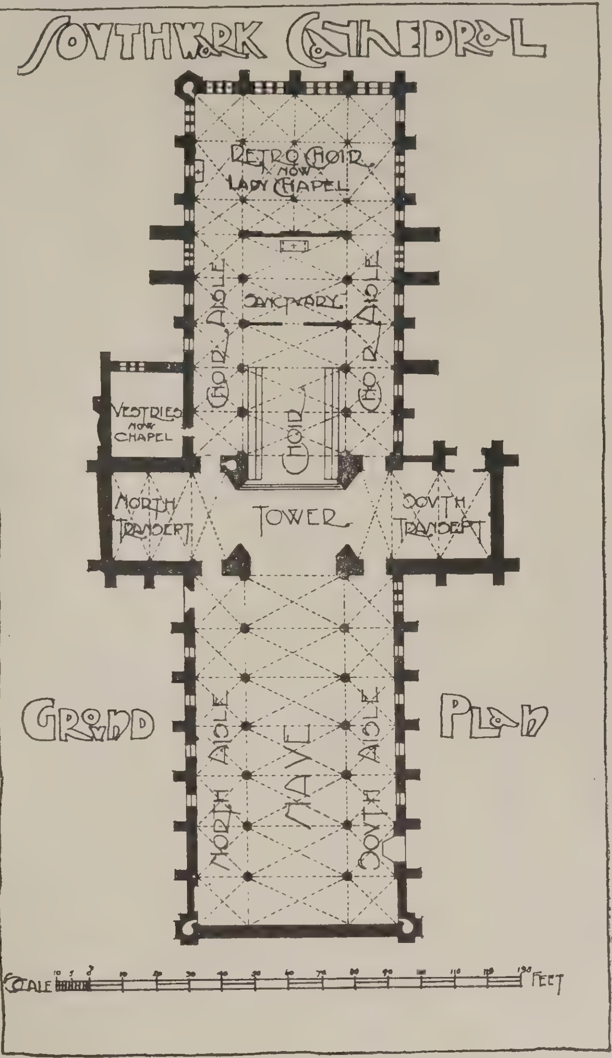
Licentiates will be required to make an annual payment of one guinea to the Royal Institute, and for this they will be entitled (1) to use the affix Licentiate R.I.B.A.; (2) to receive the *Journal*, the *Kalendar*, and other publications of the Royal Institute; (3) to use the Institute premises; and (4) subject to the charter and by-laws to attend the meetings of the Royal Institute.

In view of the necessity of closer organisation of the members of the architectural profession throughout the Empire, both for the advancement of the art of architecture and for the promotion of the interests of the profession by means of Parliamentary or other action, it is highly desirable that a knowledge of this new means of becoming associated with the work of the Royal Institute should be spread as widely as possible among those architects who are at present outside its walls.

Any action which may be taken in the future to secure a higher standard of professional attainment and a greater security for properly qualified architects can only be successful if it is based upon the support of a substantial majority of the practising architects of the Empire, and the Council of the Royal Institute hope that your Society will do all in its power to assist the efforts that are now being made to obtain this support.

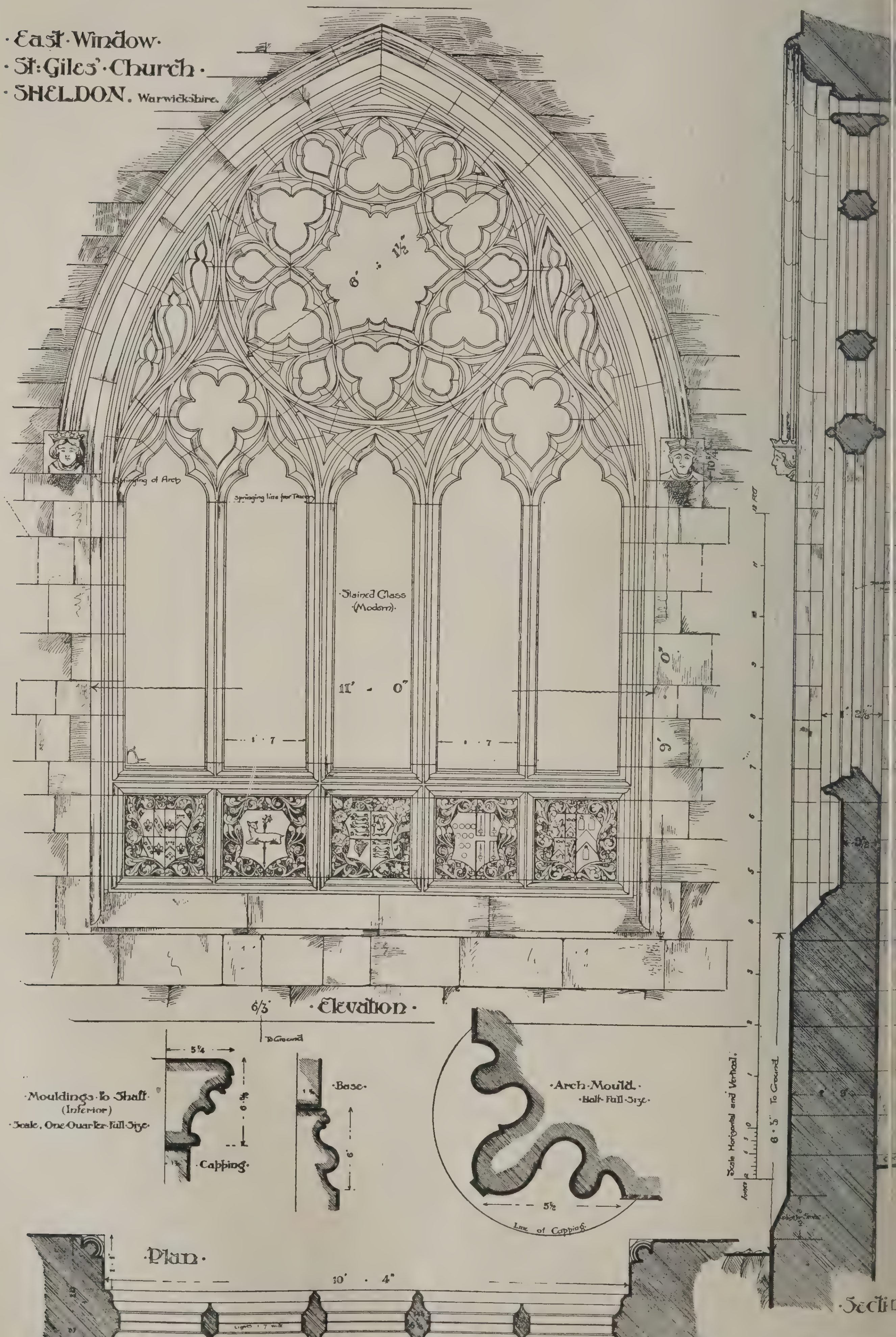
We have pleasure in sending you herewith a packet of nomination papers for Licentiates, and we shall be glad if you will take an early opportunity of making an official announcement and of taking effective steps by sending by post to all the architects in your province a notice of the creation of this class, drawing special attention to the fact that it is only open for twelve months, and informing them that the above papers are in your hands and may be obtained on application at the offices of your Society.

We feel that it is the duty of the Institute and its allied



Drawn by Mr. Reginald Pywell.
"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



Drawn by Mr. B. J. Mendham

societies to get into touch with all architects in the empire, and we are sure we may count on your zealous personal assistance to this end.—We have the honour to be, dear sir, yours faithfully,

(Signed) Ernest George (*President*).
Henry T. Hare (*Hon. Secretary*).
Ian MacAlister (*Secretary*).

9 Conduit Street, Hanover Square, London, W.: April 4.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute was held at Conduit Street on Monday, April 4, Mr. A. W. S. Cross being in the chair.

Mr. Henry T. Hare, hon. secretary, announced that intimation had been received of the sanction of the Privy Council to the revised by-laws, with one exception. They will come into immediate operation, and copies will be issued to members with the next number of the Journal. Mr. Hare also announced the decease of the following members:—Mr. W. Mansfield Mitchell, R.H.A., Mr. Jesse Horsfall, and Mr. C. A. Monday.

Mr. George Hubbard, F.S.A., F.R.I.B.A., then read a paper on—

### Architecture on the Eastern Side of the Adriatic.

There is no part of Europe less understood and less visited than the Balkan States; yet few lands are more interesting, and the struggles that have taken place in this great peninsula lying between Europe and Asia have preserved Europe from being overrun by the Asiatic.

Of the various Greek colonies which settled on some of the Dalmatian islands, perhaps the earliest came from Syracuse, and were settled by Dionysius the Elder on the island of Issa, B.C. 387. Two centuries later the Greeks were compelled to appeal for the assistance of Rome against the Illyrians, and by the beginning of the Christian era Dalmatia had become a Roman province. In 284 the Roman Empire fell to Diocletian, whose palace at Spalato forms the great central point of interest of Dalmatia. The Roman Empire was again united after many vicissitudes under that great building emperor Justinian, who reigned from 527 to 565. Under him rose Byzantine architecture, one of the finest examples of which may be seen at the Duomo of Parenzo, built between 535 and 543. The progress of the style was arrested for two hundred years, while the Avars from Central Asia overran the country, until in 806 they were subdued by Charlemagne. The Romanesque works at San Lorenzo, in Pasenatico, or at St. Donato at Zara, are examples of the crude architecture that then emerged when order and civilisation began to return. Many of the coast towns are beautified by examples of Venetian architecture, due to conquest by the Venetians of the Narentine pirates in the Adriatic. But the most lasting power of all arose in the middle of the thirteenth century, when the Ottoman Turks began to establish the predominance which lasted until the eighteenth century. It is in the interior of the country that the Turkish work is to be seen.

A typical island on the eastern coastline of the Adriatic is Veglia. In the tenth century it was subject to the kings of Croatia; in the twelfth century it fell to the Hungarian King Coloman; while later in the century it came under Venetian rule; and in 1133 it was ravaged by the Croatian pirates, and its city walls and buildings were destroyed. The inhabitants, however, with the aid of the Venetians, obtained a decisive victory on March 8, 1133, and they rebuilt the walls. At the ancient Porta Pisana the winged lion of St. Mark stands above the site of the old gateway. The Duomo is a twelfth-century building, Byzantine in the main, but with a very distinct flavouring of Romanesque.

It is deeply interesting to compare the church in San Lorenzo and the Duomo of Parenzo. The former was erected in the eighth or ninth century when the Byzantine art had been stifled by the Avars and Slavs; it is crude, deformed, and misshapen, though in it are the germs of the Romanesque style, which grew and survived longer on the eastern side of the Adriatic than anywhere else. The Duomo of Parenzo was commenced in 535 and shows a marvellous refinement, the perfection of Byzantine art being realised in the interior. It is as fine as Sant' Apollinare in Classe at Ravenna, or Santa Fosca at Torcello, and it surpasses them in the completeness of its plan, with its square atrium with a covered ambulatory round its four sides and octagonal baptistery. The chief glory of the east end is in the early Byzantine mosaics of the sixth century, forming a high panelled dado above the marble seats of the clergy, which are placed right and left of the episcopal throne. Above this the wall surface is entirely covered with mosaic of a more usual Byzantine pattern.

Pola contains much Roman work, including an amphitheatre outside the city walls which would hold 21,000 spectators, besides 10,000 who might take part in the performances.

The cathedral of Zara was probably not begun before the thirteenth century, though it retains the basilican plan. This Romanesque building, with its arcaded front, built in 1324, is considered by Fergusson to be superior to San Michele or San Martino at Lucca, or the cathedral at Pistoja. Another fine example is St. Grisogono (1175), with its external arcaded apse and delicate colonnade. It is very doubtful if anything finer of its kind could be found among the Lombard churches of Italy.

The cathedral of Sabenico is perhaps unique in its construction, for throughout the building neither brick nor wood has been used; the walls and roof are entirely of stone, no timber or tiles being introduced.

The Duomo of Traü is a building of the first importance. It was begun about 1200, and the body of the church was completed in 1440, though the tower was not finished till 1598. It has a basilican plan, and at the west end is a large and beautiful porch, which is perhaps the most perfect example of any Romanesque work that exists. In the carving there is an extraordinary wealth of Romanesque imaginings, and the whole is finished with a marvellous perfection of execution. On either side of the west doorways are great archaic lions standing on Classic consoles about 6 feet from the ground and supporting brackets on which stand life-size nude figures of Adam and Eve.

The Palace of Diocletian at Spalato covers an area of 9½ acres. Through the originality of its detail and the striking development of its construction, this building exerted a greater influence upon subsequent styles, either Romanesque or Gothic, than any other building in the whole history of architecture. It is a rectangular building, and on the north, east, and west the external walls are defended by square and octagonal towers; while on the south front, towards the sea, is what Adam calls the great cryptoporticus, having a frontage of over 500 feet. From this gallery some of the royal apartments could be entered. The royal apartments were to the south, and they were flanked on the west and east by an elaborate system of baths. The octagonal building in the south-east section is called by Adam the "Temple of Jupiter," but it is suggested by Dr. Arthur Evans that Diocletian intended the edifice to be his mausoleum. The building is now, however, converted into the cathedral of Spalato. The small temple in the south-west section was referred to by Adam as the "Temple of Aesculapius." According to Adam, possibly the block of buildings in the north-west section was for women, and perhaps the block in the north-east was for courtiers. Probably the cubicles around the external walls were for soldiers. The principal entrance was on the north, which is still called by the ancient name "Porta Aurea" or Golden Gate. The east gate was the "Bronze Gate," and the west gate the "Iron Gate." At the entrances provision was made for the raising and lowering of a portcullis. The four leading features which marked the decadence in Roman architectural forms occur in the palace in a more striking manner than in any other building: they are (1) the arch over a wide central intercolumnation; (2) capitals carrying an arch without intervening entablature; (3) columns carried on corbels; and (4) the accentuation of the Roman relieving arch over a lintel by enriching it with mouldings.

When the great wave of the Avars swept over the country in 639 the inhabitants of Salona fled from the capital and took refuge in the islands. At a later date they left the islands and took up their abode in the deserted palace of Diocletian. The walls became the city walls, and from that time the palace has been the centre of a town. Salona, when it fell before the Avars, was a mighty city surrounded by a wall with eighty-eight towers. At one of the city entrances three arches stood, the centre one for vehicular traffic and the side ones for pedestrians. The paved roadway here, as at Pompeii, shows ruts some six inches deep.

The beautiful Ragusa, unlike other coast towns, maintained itself as an independent commonwealth. The original Greek settlers at the approach of the Avars fled from Epitaurum and founded the present Ragusa on the rocky coast, surrounding it with impregnable walls. The most interesting building is the palace of the rector of the Ragusan Commonwealth, first built in 1388, and rebuilt after a gunpowder explosion in 1435.

This outlying independent State continued to build in the primitive Romanesque style till a later date than anywhere else, even in Dalmatia. The Dominican convent, by Fra Stefano, was erected about 1424, but judging by its style it might quite well be the work of the eleventh or twelfth century.

It is not only the architecture of this coast-line which is so interesting; there is a wild charm about the Balkan States which is extremely fascinating. But it has not been the Turk nor the Serb who has left the lasting memorials on the eastern side of the Adriatic; but it has been the Latin races and the descendants of the Latin races who have been the great builders, whose works should be seen to be more fully appreciated.

Mr. T. G. **Jackson**, R.A., proposed the vote of thanks to Mr. Hubbard for his most interesting account of a country which he himself, he said, knew better than any other with the exception of his own country. Mr. Jackson said it was twenty-eight years since he first saw Dalmatia, and he had no doubt many things had been altered since then, as for instance the difficulties that beset travellers. Now, no doubt, means of communication were much improved, and he had heard of the Cook conducted parties thither; nevertheless it was impossible to believe that it would ever become a popular touring country, because with one exception the roads are atrocious—mere tracks over stony heaths. With an increasing number of people visiting the country it was inevitable that the inhabitants should lose their primitive simplicity. When Mr. Jackson first went there was practically nothing available in the way of a guide-book, the best being a small one published in Trieste. Professor Freeman's account did not go further than the eleventh century, and gives no idea of what can be found after that date. Therefore to some extent he had the country to himself, at all events for the later monuments, and he had to discover what was to be seen. There was not even a connected history of the country, the traveller had to hunt it out for himself. The history was really most interesting; that of the towns and of the interior being quite distinct. The towns are survivals of the later Roman Empire; the country outside the city walls was peopled by Slavs. There was considerable hostility between the two. During the Middle Ages the cities had a history somewhat like that of the great Lombard towns. Each had its own laws and independent control, waging war one against the other without much reference to the central authority. However, they were never able to shake that authority completely off as did the Lombard towns. The history of each individual town ought really to be studied separately. The spirit of rivalry made the citizens strive to surpass the monuments erected by their neighbouring towns, just as happened in Italy. Mr. Hubbard had alluded to and shown on the screen a window at San Lorenzo in Pasenatico, purely Romanesque in appearance, and covered with a rough tracery of interlacing circles. There is, according to Mr. Jackson, an almost identical window in the Saxon church of Barnack, Northamptonshire, which might have come from the same place judging by the primitive carving. The entire district is remarkable for its great wealth in lovely embroideries, and in the work of the silversmiths. Most of the latter is of Venetian origin; some pieces bear a mark showing that they came from Ragusa; in one or two cases they came from Germany, but the majority came from Italy. The architecture of the Slavs was extremely humble, the churches and other buildings being very small. Such Slav artists as there were were absorbed into the coast towns, where they became Romanised.

Mr. **Phene Spiers** said that the ground covered was so extensive that he would only deal with one point, and that was with reference to the Palace of Diocletian at Spalato. He wished to help towards clearing away an erroneous general opinion that it was in that palace that the first sign of decadence from the true Classic style manifested itself. As a matter of fact all the changes had their birth in the East, where nearly all the new novel features to be found in later Roman buildings had their origin. It was said that some architects from Antioch came over to Spalato in order to design the palace for the Roman Emperor.

Dr. **Arthur Evans** thought that one of the points which stood out was the way in which the architecture to a great extent depended on the physical and geographical conditions of the country. In Dalmatia there was a long line of sea coast admirably adapted to prosperous development, sheltered to some extent and lying on a great line of intercourse between the Greeks and central Europe. There is a civilisation that grew from the time when Greek colonists were sent out early in the sixth century. So that on the coast civilised life goes back to the fourth or fifth century B.C. There are no great architectural remains existing there. When the Roman influence passed away the interior of the country quickly relapsed into barbarism.

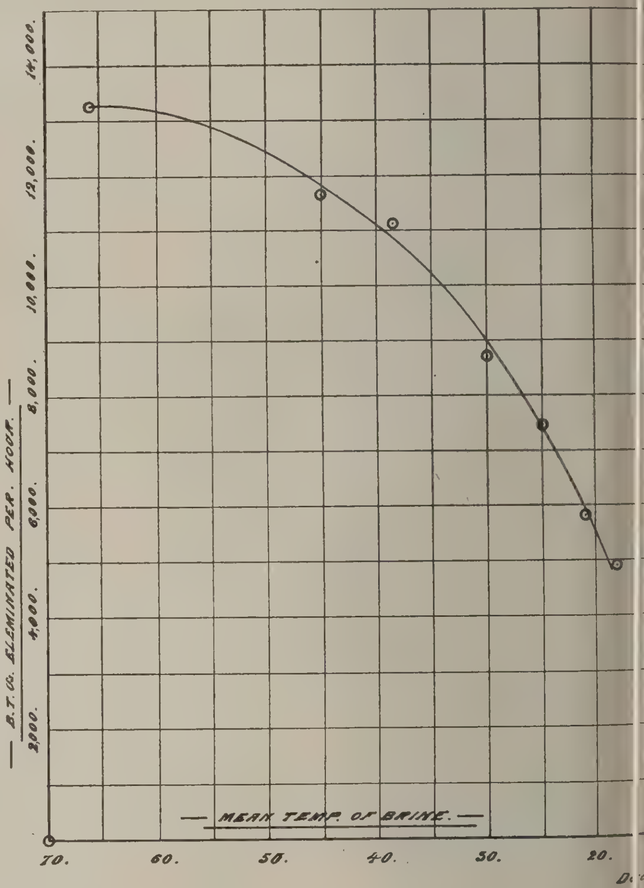
A vote of thanks was passed by acclamation and the meeting closed.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### VII.—RATING OF MACHINES.

It is important, before leaving the study of the freezing machine itself, that we should know exactly how it is rated and what units are adopted in different circumstances. The simplest method is, of course, to measure or state the B.T.U.'s which it will eliminate in some convenient space of time—say an hour. Unfortunately, however, the figures given on this basis are rather liable to misconception, and may by unscrupulous individuals be quite considerably manipulated.

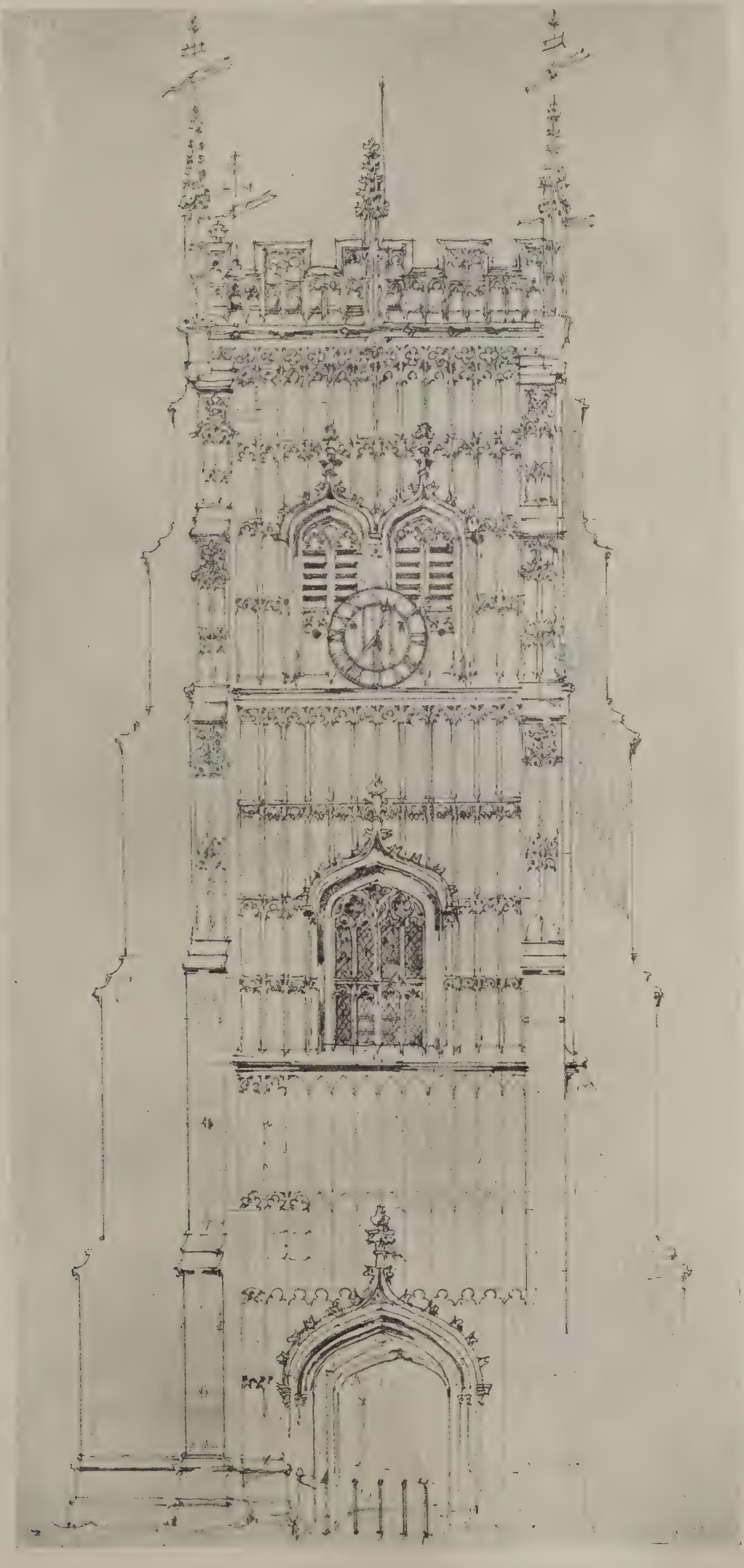


— CURVE ILLUSTRATING VARIATION IN CAPACIT
FREEZING MACHINE AT DIFFERENT EVAPORA
TEMPERATURES. —

FIG. 21.

This is due to the fact that the number of B.T.U.'s eliminated is entirely dependent on the temperature of evaporation, owing to the variation in the density, &c., of the gas.

To show this in graphic form the curve given in fig. 21 has been plotted from the results of a test which was carried out by the writer on a small machine using sulphur dioxide as a refrigerant. The evaporating coils of the machine were immersed in a tank filled with calcium chloride brine, which was first heated up to about 70° Fahr., and then the compressor having been started up, reduced gradually to a temperature of some 15° Fahr. Readings of the temperature were taken every quarter of an hour, and from these the weight of brine and its specific heat at the particular density being known, the B.T.U.'s eliminated per hour were calculated. Such a test, as will be explained later, does not admit of the highest accuracy, but for the purpose of comparing the output of the machine at different evaporating temperatures it is sufficiently near the mark.



THE BELL TOWER, EVESHAM.—Drawn by Mr. Leslie Wilkinson, F.R.I.B.A

Brine temperatures are set out horizontally and the outputs in B.T.U.'s per hour are represented by the vertical ordinates. That is to say, if we wish to find the output at a brine temperature of, say, 35° Fahr., we must first find the point marked 35° on the horizontal base, and then measure the height of a vertical line from that point to its intersection with the curve. By referring next to the scale of B.T.U.'s on the vertical axis at the side the output will be known. In this case it is seen to be 10,200 B.T.U.'s per hour. Similarly at 21.5° Fahr. the output is found to be 6,000 B.T.U.'s, and at 46.5° Fahr. it is exactly double the former amount. Obviously therefore a specification of the B.T.U.'s to be eliminated by a given machine would bind the manufacture very loosely, unless at the same time the evaporating temperature of the gas or the temperature of the medium surrounding it (*e.g.* brine in the evaporator or goods in the cold store) were specifically stated. The guarantee would then be perfectly binding.

Although this method is that which naturally first occurs to one, based as it is on first principles, in practice it is found to be rather too cumbrous for general use, owing to the smallness of the unit. To meet this objection a much larger unit is frequently employed, which is exactly equal in magnitude to the amount of heat absorbed by one ton of ice in melting, and is known as "one ton of refrigeration." The latent heat of fusion absorbed during the melting of 1 lb. of ice is, we know, 142 B.T.U.'s, hence the ton refrigeration is equal to 142×2240=318,080 B.T.U.'s. On this basis machines are rated at so many tons refrigeration per twenty-four hours, and a 10-ton compressor would in that period eliminate 3,180,800 B.T.U.'s, or 132,533 B.T.U.'s in a single hour.

One point arises in connection with this method; it must be remembered when dealing with the capacities of American machines that the ton weight in the U.S.A. is only 2,000 lb. Hence the American ton of refrigeration is only 0.893 of the British ton, and capacities stated in American units are higher by 12 per cent. than those based on the larger unit in use in this country. The metric ton is, of course, nearly equal to the British, but outputs measured in that system are usually given in calories. One calorie is the amount of heat necessary to raise the temperature of 1 kilogramme of water by one degree Centigrade. It is sometimes known, in dealing with refrigeration, as the "frigorie," and is approximately equal to 4 B.T.U.'s.

A simpler and at the same time more reliable method than either of the two which have been given, is to state the actual quantity of ice which the machine will produce in twenty-four hours. In fixing this amount due allowance has, of course, to be made for working losses, such as radiation, &c., and the cooling of the water from atmospheric temperature to freezing point. Hence the "ice-making" capacity is actually about half the "ice-melting." The beauty of the method is that it states the duty, and at the same time specifies the evaporating temperature, since in making ice the latter is always constant. The manufacturer cannot therefore escape from his guarantee, and, moreover, he can be called upon at any time to prove it by connecting up his compressor to an actual ice-making tank.

There are, of course, numerous other ways of stating the output of which a given machine is capable, but most of these are applied to particular cases, such as storing meat, cooling milk or cream, &c., and will be discussed in their respective places. The methods which we have up to now considered are those which can be applied universally without reference to the purpose for which the machine is designed. Summing them up they may be tabulated as follows:—

1. B.T.U.'s absorbed per hour.
2. Tons of refrigeration per 24 hours (1 ton = 132,533 B.T.U.'s per hour).
3. Tons of ice made per 24 hours (1 ton ice made=2 tons refrigeration).

To be absolutely accurate in any of these methods we should also specify the temperature at which the cooling water enters the condenser. If it is high the loss past the expansion valve is corespondingly great, and the output is reduced in proportion. Taking, for example, a submerged condenser with water entering at 50° Fahr., the effect of raising this temperature to 60° Fahr. would be, in a sulphur dioxide plant, to reduce the output by only 2.67 per cent. Hence it will be seen that the loss, although not absolutely negligible, is quite a small one.

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THE late Mr. Benjamin Tabberer, F.R.I.B.A., left estate valued at 38,010*l.* The sum of 100*l.* has been left to each of his clerks, Mr. W. G. Aldridge and Mr. H. Thorman.

## SOUTHWARK CATHEDRAL.

THIS church is now popularly known as St. Saviour's Cathedral. John Stow, who lived at the end of the sixteenth and beginning of the seventeenth century, states on the authority of a communication made to him by Bartholomew Linstede, the last Prior of St. Mary Overie:—"East from the Bishop of Winchester's house directly over against it, standeth a fair church called St. Mary-over-the-Rie, or Overy, that is over the water. This church, or some other in place thereof was (of old time long before the Conquest) an house of Sisters, founded by a maiden named Mary, unto the which house and sisters she left (as was left to her by her parents) the oversight and profits of a cross ferry or transverse ferry over the Thames, there kept before that any bridge was builded. The house of sisters was after by Swithun, a noble lady, converted into a college of priests, who in place of the ferry builded a bridge of timber, and from time to time kept the same in reparation, but lastly the same bridge was builded of stone, and then in the year 1106 was the church again founded for Canons Regular, by William Pont de l'Arche and William Dauncey, knights Normans."

This has been doubted as to many facts. Probably an early Saxon convent was there and destroyed by the Danes in the tenth century. Tolerably well authenticated is the fact that in 1106 William Pont de l'Arche and William Dauncey (or D'Ansey) did renew foundation for Canons Regular of the Order of St. Augustine (Black Canons). Very few traces of the building then erected remain; it was burnt down in 1207.

Peter de Rupibus, Bishop of Winchester 1205-43, built the chapel on the south side of the choir. It was founded and dedicated in honour of God and St. Mary Magdalene, and was afterwards used as the parish church; the nave was probably built in the time of the same prelate.

The choir, choir-aisles, and retro-choir a little later. Building was in progress as late as 1273, the whole of both transepts among other parts being unfinished. The north transept was built first, and the south transept about 1327-77.

In 1377 fire damaged the nave, and in the time of Henry IV. Perpendicular windows were inserted in it. The flying buttresses were then removed and the vault fell in 1469; the vault was re-erected as oak-groined vaulting. The roof of the north transept was done in a similar manner. In 1520-28 the reredos was erected by Richard Fox, Bishop of Winchester, and the two upper stages of the tower were erected at this time.

At the dissolution of monasteries the parishes of St. Mary Magdalene and St. Margaret's, Southwark, purchased this church as the parish church, the two parishes uniting under the name of St. Saviour's.

The lady chapel, which was east of the retro-choir, was let to Master Wilson, corn chandler, till 1624; in 1830 it was taken down to permit of the approach to the new London Bridge. The retro-choir, in the old days used for processions, &c., is now used as a lady chapel. The shafts to the windows and piers are detached. The stone used is very hard and smooth, and resembles Kentish rag. The outside walling is faced with flints.

In 1821 the choir was restored by George Gwilt, and in 1822 the chapel of St. Mary Magdalene was removed, and south side of choir renewed.

In 1830 the transepts were restored by Robert Wallace, and in the following year the roof of nave and north transept was removed, and the church was roofless for seven years. In 1839 the new nave was erected by Sir Arthur Blomfield, and the high pews, gallery, three decker, floor above choir (seven steps) were taken down and removed. It is interesting to note that among pilgrims to Canterbury from this church are John Gower, Shakespeare, Massinger, and Fletcher.

## ILLUSTRATIONS.

### A CHURCH IN REINFORCED CONCRETE. DESIGN FOR GRISSELL GOLD MEDAL, 1910.

THE drawings we reproduce were submitted by Mr. MORLEY in the competition for the GRISSELL gold medal of 1910, and in our opinion ran the successful design very close.

## FILIPPO BRUNELLESCHI AND THE RENAISSANCE.*

*(Concluded from last week.)*

THERE are few items so wholly illustrative of Mediæval beauty and feeling as some of these decorated chapels at Florence, and one does not wonder at the enthusiasm either of the critics or at the raptures of Ruskin in discussing them. Upon a wall of this chapel the visible church is typified by the Duomo of Florence, which has its proper nave of four bays but with flying buttresses, and an octagon crowned by a cupola of very similar pointed form to the present one surrounded by the semidomes of the transepts and eastern tribune. But it is important to observe in this carefully drawn representation, in which we find early perspective nervously making itself evident, the fundamental variations from the present cathedral. Some of these are the existence of flying buttresses, as well as the extending raking buttresses to the transept apses, also the treatment of the square angles of the octagon, but chiefly the absence of the great upper story of the octagon, corresponding to the drum of a dome, with its eight eyes. Some difference will be noted in the setting out of the vaulted apses to the transepts, the apices of which are built in front of the walls, but we observe that a lantern is added to the dome. The whole forms an unmistakable representation of the Duomo, about half a century before Brunelleschi erected his dome, which, apparently so long before, was decided upon and accepted both in its general lines and defined intentions.

Professor Charles Eliot Norton has pointed out that after the calamity of the plague of 1348, in which Boccaccio declares that more than 100,000 died within the walls of Florence, one of the natural consequences was a sudden outbreak of pious superstition. Numerous sums had been given and bequeathed by dying men to the Church, so that when order was restored to the community the Church found itself richer than ever before. To quote Professor Norton:—

"Old things had passed away; old designs appeared unsuited to the new conditions. To such a spirit the Duomo, begun sixty years before, in days of comparative weakness, seemed hardly to correspond with the demands of the more lavish and luxurious age. Florence was more pre-eminent than ever among the cities of Tuscany, and her Duomo ought to be representative of her present power and wealth. Accordingly, and doubtless after much deliberation, it was resolved, 'out of regard to the magnificence of the commune and the riches and fame of the city and the citizens,' to adopt a new design for the Duomo on a grander scale than that of the building planned by Arnolfo. The breadth was to remain the same, perhaps in order to preserve the beautiful side walls already constructed; but the walls were to be raised about 21 feet, the length was to be increased by more than a third, and the central area and the eastern end of the church were to be vastly enlarged. This change of design required not only the destruction of the work already done within the walls, but also the strengthening of the foundations, and a doubling of the façade wall."

Professor Norton adds:—

"This reconstruction of the Duomo has been generally overlooked by the historians," and "it appears that only a general scheme of the reconstruction was adopted, leaving the consideration of details until the time when, in the progress of the work, a decision in regard to them might become necessary. Probably all that remains of Arnolfo's building are the foundations and part of the interior brickwork of the façade, and the side walls for about 175 feet eastward from the front."

Francesco Talenti was appointed architect, having succeeded the celebrated Andrea Pisano, and in 1357 the digging for the foundation of the new piers was begun.

Ruskin has fallen upon the vast scale of the interior with zest in his "Mornings in Florence"; the contrast to the scheme of the conventual and collegiate cathedrals of France and England which employ a developed multiplicity of parts to give measure to the eye is very marked, but the difference might almost be described as that of one mind to many. The simplicity and homogeneity of the design of the plan, the apparent thinness of the side walls being that of the pre-existent design, is attractive and architectural. I would venture to urge that to a mind prepared to admit all the charms of the nave of Westminster, with its lofty proportions and narrow vistas, it should not necessarily be impossible, difficult, or provocative of that eloquent vituperation customary to the last generation of enthusiasts, to accept and value the purpose and dignity of this great provision of width, spaciousness, and reduction of pillar area evident in the huge municipal nave of Florence. This spaciousness is Italian, the vast cool enclosure in the hot sunny climate is a phase of ecclesiastical design required by circumstances, and is here achieved with constructive skill and common sense not inferior to any traditional development of Mediæval buildings in northern circumstances with different materials. The rubble core and ashlar facings of the north make greater demands upon the floor space than the slender brick piers of the south, and in a just comparison it is not so evident that the nave of Florence deserves Mr. Ruskin's narrow but bitter judgment that "the most studious ingenuity could not produce a design for the interior of a building which should more completely hide its extent and throw away every common advantage of its magnitude than this of the Duomo of Florence."

It would be tedious if interesting to digress upon the variations in Mediæval building north and south of the Alps, and tempting to enter upon the uncertain influence here of the building guilds of Northern Italy, though each digression has a bearing upon our subject. It will be impossible however to appreciate Brunelleschi's task unless it is borne in mind that the progressive development of Mediæval cathedral building is regulated and marked by the construction of vaulting. The fact that it was necessary to vault the nave occasioned the whole series of factors of aisles and buttresses, and conditioned the plan of transepts and eastern extension. The use of the pointed arch had enabled vaulting chambers of all shapes and sizes to be constructed with facility in diverse materials by the employment of ribs which gradually assumed to themselves nearly all the constructive qualities. This rib principle left the spaces between without strains or stresses, so that they were filled in with the lightest material, or even left in an open veil of tracery, as in Henry VII.'s Chapel. In Italy the use of brickwork for vaulting enabled the fillings to be extended, but it never became the practice there, as here, to multiply the strengthening ribs for the sake either of stiffening the vault or for æsthetic reasons. The earlier and later Mediæval vaults of Italy, alike, were quadripartite in system, and, as at Florence, of the greatest size, the nave having a width of 55 feet, and consisting of only four immense square bays. The nave of Westminster Abbey having a clear width of 35 feet, employs twelve bays in a similar length of 240 feet.

The principle of both is, however, the same; the rectangular chambers of the vault at Florence are spanned by pointed arches, having stone ribs at the intersections and brick cells between.

The boldness with which the principle of stone groin ribs with brick filling had been employed in the vast span of the nave seems to have convinced the builders that no greater difficulty would attend the vaulting of the octagon. It may be remarked here that the use of tie-rods to the vaulting and arcades of the nave is an economy designed to dispense with flying and other buttresses, and that where the octagon was placed, and masses of wall occur which provide abutment for the great arches, neither protruding buttresses nor tie-rods are employed.

The enormous scale of the octagon, 135 feet across, with the choir stalls grouped in the centre, was to provide the city with the grandest temple then in Western Christendom, and if the cupola shown in the fresco of the Spanish chapel were superposed upon the basis of Talenti's octagon, but little diminution of its external glory and none of its internal beauty or usefulness would have been sacrificed.

The greater work began in 1357 was pushed on, and ten years later the four bays of the nave were nearly completed. Many consultations with the Board of Works ensued, and difficulties soon became apparent. In 1368 work was begun on the eastern apse, and in 1369 Talenti was succeeded by his son. Municipal funds being required for other objects, among them the erection of the Loggia de' Lanzi from Orcagna's design, it is not till 1382 that activity at the cathedral is again evident, for in 1383 the building of the chapels to the choir was commenced and commissions distributed for sculpture. In 1407, after nearly forty years, the eastern tribune, with its five chapels, was completed, and at the threshold of the Cinquecento the construction of the octagonal vault could no longer be deferred.

I have little doubt that it was believed that the vault of the ancient octagon baptistery of St. John, opposite the west front of the Duomo, and so well beloved of all Florentines, afforded all the precedent requisite for that of the Duomo, though approaching double its span. The baptistery vault consists of a plain-pointed brick arch springing from each side of the octagon without ribs and very closely represented by that of the completed Duomo. It was not a dome; the art of building domes, we might assert, was, if not unknown, certainly not practised by mediæval builders, even when circular, and therefore lending themselves to domical treatment as in the case of the Baptistery at Pisa. These buildings were simply groined with pointed vaults; but in Florence both the prototype at the baptistery and the greater example at the cathedral are polygons—*i.e.* octagonal.

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* A paper read before the Architectural Association on March 18, by Prof. Beresford Pite.

It would be a longer digression to consider the relation of domical construction to the planning of Christian churches. The Pantheon at Rome presents no difficulty, the plan being a circle and the dome a semisphere. By the time Santa Sophia at Constantinople was erected the method of poising a circular dome above a square plan upon piers, by means of pendentives, had been attained, and Anthemius of Tralles had earned the compliment for Justinian of suspending his dome from heaven by a chain.

St. Mark's at Venice is an Italian instance of a Constantinople method, and its group of five domes is entirely pre-Gothic, each being supported on four pendentives. A true dome is a vault—that is, one which is arcuate on plan as well as in section, horizontally as well as vertically, having the strains equally distributed throughout its hemisphere, without constructive ribs, and therefore without the distinction that exists in Gothic vaulting between the rib and the web. The true dome is, theoretically, as homogeneous as an inverted earthenware basin, and the Gothic vault is as distinct in its texture as an opened umbrella with its armature of ribs and flimsy filling.

The four centuries that lay between St. Mark's, Venice, and the octagon at Florence obscured most singularly from the vision of the hide-bound guildsmen the attractive power of the dome as a constructive method. Known but unknown, not scorned maybe, for they decorated them with the Oriental quaint cupolas of the fourteenth century which give character to the Piazza of St. Mark, but ineffective and buried as far from their building practice as radium.

Another aspect of domical vaulting, however, was not quite foreign to the Mediæval builders of Florence. The fresco in the Spanish chapel depicts an octagonal cupola crowning the cathedral with a domical form having external dignity and beauty, forming a feature by which the building would be recognised as domical, and entering into the perspective and landscape with a graceful curved outline that is the proper complement of the apsidal tribunes around its base.

This external domed outline was practically new to Mediæval building, the internal cupolas and lanthorns of Italian churches being covered with roofs and concealed behind screens of arcades and colonnades. Yet neither the fresco of the Spanish chapel nor the dome erected by Brunelleschi quite convince us that the external aspect of the dome had æsthetic influence or value to that generation. It was not until a later period in Bramante's career that there is clear evidence of appreciation of the usefulness of the dome to external effect.

But a generalisation citing the Pantheon at Rome first as accomplishing the successful employment of the dome as a vault, Sta. Sophia at Constantinople as achieving its support upon pendentives high above the free area of the floor, Florence as sustaining the lantern necessary to crown its external aspect, and then St. Peter's at Rome and St. Paul's at London, as developing alike both the external and the internal values of the dome, is useful, interesting, and relatively sound. The doubtful point is whether Brunelleschi and his contemporaries at all desired to emphasise the dome as such externally, and whether it was a motive in the design or not. I would suggest from the standpoint at which he and they stood, still in the Middle Ages, that external composition as such was not present to their minds. The harmonious lines and geometrical masses of the plan related to the vault system, and the elevation of these masses was determined statically through the exigencies of the vaults so that constructive and not æsthetic reasoning led to the extrusion of the great mass of the octagon vault in its really magnificent constructive form.

The competition of sculptors inaugurated in 1401 for completing the series of bronze doors to the baptistery marks an epoch in the development of the arts of sculpture and bronze-founding. The competitors were selected, and young men are found among the six; Filippo Brunelleschi was but twenty-four, and Lorenzo Ghiberti, whose panel was accepted, was twenty. The great reputation of these two young men in their own community may be safely assumed, and each more than justified this early promise by strenuous work in later life. It is stated by a biographer of Brunelleschi that the commission of assessors proposed to divide the commission, who gives Brunelleschi the credit of declining the work under the circumstances; but in any case the work was given to Ghiberti towards the end of 1403. Vasari's story of Brunelleschi's journey to Rome, accompanied by his attached friend and junior by nine years, Donatello, seems to require further proof, as Professor Norton notes that Donatello appears as assistant to Ghiberti both in his first and in a further agreement for the execution of the gates. It is clear, however, that Brunelleschi, who was of good family, sold some property, and with the proceeds paid the expenses of his visit to Rome, the first of many—and it appears that he worked at his handicraft as a goldsmith, and exercised his mechanical genius at making clocks, maintaining himself thus, but not without visits home again from time to time.

The condition of Rome after practically a millennium of decadence cannot easily be realised. The great city had been for centuries in a repellent condition of decaying splendour. The Imperial monuments had not yet attained the credit and charm of picturesque ruin under which Piranesi knew them, and were nothing more than the dilapidated symbols of a departed glory. The exile of the Popes during three-quarters of the fourteenth century, the rival Popedoms (the Council of Constance which settled them was held in 1414), the factions and troubles crystallising in Rienzi had all tended to divert from Rome any tendency to regard it as an emporium of monumental art. The fame of pagan and persecuting Rome was still obnoxious in its monuments, and the scenes of martyrdom had not yet become sanctified by artistic as well as religious tradition.

As we have already seen, the treasures of classic literature were gradually being revealed, mainly through more cordial relationships with Constantinople at the end of the fourteenth century, but the morning of the glory of the architecture and arts either of Greece or Rome was unknown when Brunelleschi visited Rome, an eager artistic Florentine, probably disappointed at the clouding of his hoped-for pre-eminence in his art of sculpture by Ghilberti, though still strongly possessed with a zealous patriotism and fully conscious of the steps taken for completing the greatest cathedral of Italy.

It is not difficult for us to realise what Rome could reveal to such an intelligent artist. Just breathing emancipation from tradition, and conscious that Ghiberti had struck a freer and fresher note in sculpture than any before, the strong genius of his young admirer and follower, Donatello, tended in the same direction, and we are told pretty stories of how Donatello "had eyes only for sculpture"—the great antiques were not then unearthed—while Brunelleschi devoted himself to the monuments. Vasari writes—and how sympathetic every travelling student must feel as he reads!—that "he took no time either to eat or sleep, but every thought was of architecture which was then extinct; I mean," he says, "the good old manner, and not the Gothic and barbarous one, which was much practised at that period." Vasari imaginatively describes his interest in the Duomo at Florence:—

"He never rested while in Rome until he had well pondered on all the difficulties involved in the vaulting of the Ritonda (the Pantheon) in that city, and had maturely considered the means by which it might be effected. He also well examined and made careful drawings of all the vaults and arches of antiquity; to these he devoted perpetual study, and if by chance the artists found fragments of capitals, columns, cornices, or basements of buildings buried in the earth, they set labourers to work and caused them to be dug out."

Vasari imputes immense activity to him, and probably confuses the studies spread over many visits at different periods of his life. He adds:—

"Nor did he rest until he had drawn every description of construction, temples round, square, and octagon; basilicas, aqueducts, baths, arches, the colosseum, amphitheatres, and every church built of bricks, of which he examined all the modes of binding and clamping, as well as the turning of the vaults and the arches."

Brunelleschi appears to have been again in Florence three years after the competition for the bronze gates in 1404, as he matriculated as a goldsmith on July 2 in that year; the celebrated guild, which included modellers, workers in metal, and painters. To obtain civil rights it was necessary for all Florentines to belong to one of the guilds of art, which were represented in the civic government by twenty-four Consuls. The Signoria or members of the chief government acted in conjunction with the Consoli in initiating such works as the baptistery gates. The patrons of the cathedral works were the clothworkers, and it appears that in November, 1404, the Board of the Works appointed a Commission of four Consuls of the clothworkers, and nineteen special commissioners selected from the goldsmiths' and masons' and carpenters' guilds

Among the goldsmiths we find Ghiberti and Brunelleschi; the reference to the Commission was the cornice to the external walls. An interesting example of these Gothic bracketed parapets can be observed on the Loggia de' Lanzi; that to the cathedral was built in the accepted manner, and no impress of Classic idea seems yet apparent as an evidence of Brunelleschi's Roman studies. On February 16, 1405, the Commission dissolved. The building works at the cathedral proceeded slowly, and in 1407 the eastern tribune was finished, and those to the transepts were well forward.

It is probable that Brunelleschi spent the ensuing years until he was forty at Rome, a reputation for knowledge of architecture, however, accruing to him at home during the period of his absence from Florence. He must not be regarded as a disappointed sculptor who exiled himself from his own field of executive art through jealousy of an accomplished rival, but as having discovered a new source of inspiration and study in that combination of mechanics, geometry and art afforded by the buildings of ancient Rome from which he could not tear himself away. We do not find him again in Florence until 1417, ten years after the Commission about the cornice, when the Board voted him ten golden florins for drawings and work connected with the cupola. By this time the walls of the octagon had been raised above the surrounding roofs by an additional stage which provided a great clerestory, and the eight round windows or eyes were in progress.

It is not easy to understand how this stage can have been reached without the adoption of some well-defined scheme for the vaulting, as the elevation above the abutting walls removed it beyond the possibility of employing them as buttresses. The provision of this drum storey lifted the cupola vault from the category of Gothic vaults, and at once placed it among the long-forgotten and forsaken series of domes originating with the Pantheon at Rome, and developing in the later epoch of Byzantine architecture. A dome poised upon a drum has to provide for its own thrusts, which should be reduced to a minimum by horizontal arcuate construction, and can then be counterpoised by weight placed vertically upon the haunch as in the *gradene* of the Pantheon. The Gothic pointed vault, however, could not exist even momentarily without the ample lateral abutment of flying buttresses or massive walling; and it has already been pointed out how iron tie rods provided for this in the vaulting of the nave. I must confess to the strongest suspicion, though there does not appear to be direct evidence to support it, that the elevation of the cupola is due to Brunelleschi's advice, and that his observations at the Pantheon convinced him that what had been done by the ancient Romans was not beyond his powers. It is certainly highly probable that this height would not have been erected without reliance upon some guide or scheme for dealing with the thrusts of the vault. In any case, embarrassment attended upon the Board; the Guild of Master Masons seem to have exhausted their traditions, and the actual need for an impossibly big centring upon which to build the vault, after the manner of the baptistery, though so much larger, brought the works to a standstill.

The variation from the Spanish Chapel fresco raises the whole question of the use of working drawings; it would appear that designs existed, of which the fresco of the completed Duomo is evidence, and yet the deadlock and absence of prevision would indicate that drawings of any practical value did not exist, as they would have obviated progress to the point up to the edge of the impossible.

An anonymous contemporary of Brunelleschi's, whose work is the probable basis of Vasari's as well as of other biographers, tells us, "But if the master builders had seen difficulties, Philip showed them far more. And someone asking, Is there, then, no mode of erecting it? Philip, who was ingenious also in discourse, replied that if the thing was really impossible, it could not be done; but that if it were not so, there ought to be someone in the world who could do the work." The recorded payment of ten florins was not probably made only for this philosophic stimulant, but for advice and work in connection with the whole drum storey and its eight suspiciously Roman eyes.

Between this year (1417) and 1420, when Brunelleschi, Ghiberti, and Battista d'Antonio, master mason, were jointly appointed to build the cupola at a salary of three florins a month each, there was much evident controversy, and there is in the anonymous biography and in Vasari much picturesque description of indecision on the part of the Committee, rivalry on the part of the "profession," and strategical manœuvres between Rome and Florence by Brunelleschi. Amidst it all, the fact ultimately emerged that the professed sculptor-goldsmith, but amateur builder, had science and skill enough to make him confident of his ability to design scaffolds and construct a vault upon the huge octagon, 135 feet across, that would stand either without abutment or cross-ties. The three years' discussion and disputation amounted to a conviction that the little, clear-headed man of forty-three could do it, and his mystifications and secretiveness, his sudden absences, and vigorous assertiveness, were the means by which this conviction was produced.

The joint appointment of the popular artist Ghiberti, with his strong local interests (Florence had become enthusiastic over his bronze doors), and of the recognised professional man, Battista, seems, under the circumstances, reasonable, though the difficulties of joint control were little compared with those of joint reputation which were ultimately involved. This latter point was everything to such a character as Brunelleschi's, and led to the squabbles with Ghiberti, and to the ultimate demonstration that Brunelleschi could and would carry the works to successful completion alone.

A competition was inaugurated on August 19, 1418, for the designs for the cupola, and a premium of 200 florins offered, the time extending to December 12. In the next year Brunelleschi and Ghiberti each were commissioned to make models on a large scale, and Brunelleschi employed Donatello to assist him with Nanni di Banchi. A brick model was made, based on his Roman studies, exhibiting the apparently impossible feat of how to build a dome without centring, an achievement derived from the Pantheon, and embodying the fundamental difference between a dome erected in horizontal rings or series, each complete and supported on its predecessor, and the mediæval groined rib to which, from the springing, a wooden centring piece was necessary.

The Board of Consuls appointed four additional citizens as assessors to assist them in deciding, and spent some months in anxious deliberation upon the models. Brunelleschi presented a report which has been preserved in the pages of his biographer and Vasari. The latter depicts the author as previously discussing with the committee in such growing heat at their inability to understand him that they ordered him to leave the room, which he, refusing to do, was removed *à la suffragette*, though ultimately, however, as we have seen, he was appointed with two colleagues.

The report is of sufficient clearness to guide us to an understanding of his scheme, and may be cited at some length:—

"The difficulties of this erection being well considered, magnificent signors and wardens, I find that it cannot by any means be constructed in a perfect circle, since the extent of the upper part, where the lantern has to be placed, would be so vast that when a weight was laid thereon it would soon give way. . . . I have, therefore, determined to turn the inner part of this vault in angles according to the form of the walls, adopting the proportions and manner of the pointed arch, this being a form which displays a rapid tendency to ascend, and when loaded with the lantern each part will help to give stability to the other. The thickness of the vault at the base must be three braccia and three-quarters; it must then rise in the form of a pyramid, decreasing from without up to the point where it closes and where the lantern has to be placed, and at this junction the thickness must be one braccia and a quarter.

"A second vault should then be constructed outside the first to preserve the latter from the rain, and this must be two braccia and a half thick at the base, also diminishing proportionally in the form of a pyramid in such a manner that the parts shall have their junction at the commencement of the lantern, as did the other, and at the highest point it must have two-thirds of the thickness of the base. There must be a buttress at each angle, which will be eight in all, and between the angles in the face of each wall there shall be two, sixteen in all; and these sixteen buttresses on the inner and outer side of each wall must each have the breadth of four braccia at the base. These two vaults, built in the form of a pyramid, shall rise together in equal proportion to the height of the round window closed by the lantern. There will thus be constructed twenty-four buttresses, with the said vaults built around, and six strong and high arches of hard stone, well clamped and bound with iron fastenings, which must be covered with tin, and over these stones shall be cramping-irons, by which the vaults shall be bound to the buttresses. The masonry must be solid, and must leave no vacant space up to the height of five braccia and a quarter; the buttresses being then continued, the arches will be separated. The first and second courses from the base must be strengthened everywhere by long plates of hard stone laid crosswise, in such sort that both vaults of the cupola shall rest on these stones. Throughout the whole height, at every ninth braccia, there shall be small arches constructed in the vaults between the buttresses, with strong cramps of oak, whereby the buttresses by which the inner vault is supported will be bound and strengthened ; these fastenings of oak shall then be covered with plates of iron, on account of the staircases. The buttresses are all to be built of hard stone, and the walls of the cupola are, in like manner, to be all of solid stone bound to the buttresses to the height of twenty-four braccia, and thence upward they shall be constructed of bricks, or of spongite, using the lightest. Eight ribs of marble shall be formed at the angles of the external surface of the cupola of such thickness as shall be requisite ; these shall rise to the height of one braccia above the cupola with cornices. Thus the cupola shall be constructed after such manner as shall be determined by the masters who may have to build it, since practice teaches us by what methods to proceed."

This remarkable document shows actually the parting of the ways between rib-vaulting and domical construction, the horizontal linking together of the buttress ribs with lateral arches, the provision of double vaults, and the clear perception of the effect of putting weight upon a semicircular vault all evidence an intelligent discerning analysis of the Roman examples.

Another address by Brunelleschi runs as follows:—"Doubtless great things are always difficult to accomplish, and if ever anything was difficult, this affair of yours is more difficult than you perchance are aware, for I do not know that even the ancients ever vaulted a vault so terrible as this will be. And I, who have often thought on the armatures required within and without, and what means could be invented so that men could work on it with safety, have never succeeded in solving the difficulty, and I am dismayed not less by the breadth than by the height of the building. If, indeed, it could be covered by a spherical dome, the mode might be adopted which the Romans employed in constructing the dome of the Pantheon, but here we must adopt an eight-sided design with such joints and bindings of masonry as will be most difficult to execute."

The design included a great bond of timber near the base, bound with iron ties, to encircle the dome and collect any outward thrusts ; this was completed in August, 1423. The position, intention, and design of this tie is interesting in connection with the Italian practice of relying upon ties to their Gothic arches ; this bond timber has answered its purpose fully, and realising that the whole stability and success of the vault consisted in maintaining a horizontal system by means of the connecting arches between the buttresses, we regard this timber bond as an additional precaution illustrating the same principle.

We cannot stay to dwell upon the interesting story of Brunelleschi's relationship with the Guild properly charged with building, who actually once locked him up for being a blackleg, or his professional difficulties with Ghiberti, whose appointment resulted in nothing but unpleasantness. Brunelleschi's mechanical and organising genius found ample scope in the design of flying scaffolds and screens, after that the vault had risen to a point where it became dangerous to the workmen, but consistent perseverance with the system of horizontal binding by arches, the wooden bond, and series of stone cross-ties between the two vaults succeeded, so that at length on June 12, 1434, the cupola closed over the central space. In the words of Professor Norton, "It had grown slowly, marvellously, in the eyes of all beholders, who saw its walls rise, curving over the void without apparent support, held suspended in the air as if by miracle. Brunelleschi's fame was secure, henceforth his work was chief part of Florence."

Pope Eugenius IV. fled from Rome to Florence in 1434, where he was welcomed, and with great pomp consecrated the church on Lady Day, bestowing the Golden Rose upon St. Mary of the Flower. The work on the cupola was not completed until 1436, when on August 30 the Bishop of Fiesole mounted the dome to bless it. The lantern still remained to be its crown. For this Brunelleschi had made a model, but the co-operative idea was so strong that other designs were invited and considered, among them one by an adventurous but aristocratic lady, whose appearance in such an undertaking seems to have excited the contempt of Vasari, who says that even "a woman of the house of Gaddi ventured into the competition." It will be remembered that Taddeo Gaddi was appointed architect a century earlier to complete Giotto's campanile, and was the painter with Memmi of the Spanish Chapel.

Meetings and discussions ensued, and on December 31, 1436, the Board unanimously decided "that the said lantern should be constructed and built according to the model of Philip Master Brunelleschi, and that the ordering and execution of the work should be committed to Philip."

The procuring of marbles for this work and some years of delay ensued, together with war, plague, and contentions. The funds fell off, Brunelleschi's salary was reduced one-half ; for three years there is no record of work. In 1445 it was resolved that "Philip, who said that he could do the work," be appointed "sole overseer for the term of his life" ; with the extraordinary qualification but "no longer," at a salary of 100 florins annually.

Brunelleschi was now sixty-nine, and died on April 16, 1446, without seeing the completion of the lantern ; there was genuine and wide sorrow at his death ; his body was laid within the Duomo, and it was ordered that the marble slab upon it should be inscribed "Filippus Architector."

This paper has now for a considerable time trespassed upon the moments of the night, and apology is needed for its want of compression.

Brunelleschi's life-work was not, however, confined to or limited by the completion of the Duomo ; in 1420, the year of the model of the cupola, he began the erection of the mortuary chapel for the Pazzi family in the cloister of Santa Croce, a small rectangular apartment covered by a most interesting convoluted dome supported upon pendentives. This work exhibits with fulness the charm of Brunelleschi's power as a draughtsman and designer ; the elegance, refinement, and originality of the whole are wonderfully fascinating and characteristic. The original vigour of the vaulted atrium, with its delicately-moulded attic storey and beauteous frieze ; the delicacy of the doorway and the entire freshness and grace of the relief and treatment make this work a gem of Renaissance, as it indeed is its first full architectural flower. A work such as this exercised a powerful influence in Florence as justifying Brunelleschi's confidence in himself, though no part of his work at the Duomo offered the artistic scope of this little building. His intimates, Donatello and Luca della Robbia, assisted in the frieze and internal roundels and plaques.

The beautiful series of drawings by Mr. A. R. H. Jackson published a few years ago in the Architectural Association Sketch Book, illustrate this building most fully. It may be remarked that the dome has no external expression.

In 1421 he designed the portico to the Foundling Hospital, which has the celebrated Bambinos of della Robbia, a work characterised by the same delight in graceful proportions and refined mouldings, qualities which, it may be noted, were not derived first hand from Classic precedent, but infused by his own genius.

In 1426 the foundation of the great church of San Lorenzo was laid ; in the simplicity of this plan and the great success of the order and arcade, the same quality of refined grace is working upon a basis, well laid, of early basilican planning. The late Roman tradition is laid aside, and the architectural value of the order demonstrated without pedantry or antiquarianism.

The sacristy, the older one of San Lorenzo—the Medici Chapel, with the monuments by Michel Angelo, being called the New Sacristy—is also one of the most remarkable and successful buildings of Florence. The dome is employed upon properly-developed pendentives over the square apartment, and again over the altar recess. The fresh originality and freedom is very interesting, the architect evidently feeling his way to originality in dealing with his problem, reflecting with ease and pleasure the fruits of his classic studies.

The church of San Spirito was begun in 1428, and follows San Lorenzo very closely both in plan and effect ; these make a remarkable pair of churches, like sisters resembling each other with a charming family grace and elegance.

No work of Brunelleschi's after the Pazzi Chapel has such a direct appeal to an eye jaded with the later richness of the Renaissance than the Badia at Fiesole, illustrated and described with enthusiasm by Mr. Anderson. It illustrates remarkably that the discovery of the inexhaustible store of Classic ornament, and of its luxurious use, had not in any way corrupted a strict and almost Puritan taste in the employment of decorative features ; the cloister, the chapel, and the refectory are simply delicious in their delicacy, and in complete value accorded to each ornamental feature and element. The proportions are not guided by any convention and are fresh and natural to the building. The carving evidences the fastidiousness of a goldsmith in dealing with a rare opportunity in a precious metal.

The civil buildings that fell to Brunelleschi are neither few nor unimportant. His reputation brought him private patrons, for whom he designed the immense Pitti palace ; the setting out of the immense façade to the Piazza is his.

though the front to the Boboli Gardens is later, and by Ammanati. The Pazzi family palace, now Quaratesi, is another example of this class. Both are characterised by breadth, simplicity, and strength. Originality is avoided, the Tuscan type being adopted with small refinements throughout, but a larger breadth is always maintained.

These buildings laid or preserved the lines upon which the Florentine palaces afterwards developed, Brunelleschi's great pupil Michelozzo continuing his tradition with power in the great Riccardi palace for the Medici family.

The whole pathway of Renaissance architecture was now prepared, lines of progress and discovery made possible, and precedent provided. The onward march of the movement is from Brunelleschi to Michel Angelo, through a century of wonder as we look back through the mists of ages and reconnect it with the work of painters, sculptors, and craftsmen. What the movement owes to Brunelleschi it is not easy to estimate; the debt is at once so great and so involved with the completion of mediævalism.

Renaissance architecture did not come to Florence, as to France, England, and the rest of Europe, by emulation and report of already achieved wonders, but it was created, though recreated in a sense, by Brunelleschi's enthusiastic studies, force of personal character, and marvellously refined architectural discernment. Whether or not the nineteenth century in England in any way reflects the fifteenth century in Italy is a fancy with which it would be tempting to play, as with a dream which exaggerates extremes of delight and absurdity. Have not we known more Brunelleschis than one among our student enthusiasts? Have we not wrestled with clients' problems and immeasurably bold achievements? And is not England decorated with nineteenth century monuments of architectural individuality, triumphant expositions of all the virtues of foreign study and home conquest?

But where is our Duomo? Where has the problem of a changing epoch fallen into our hand? For this we wait; it may come yet; so learn patience, perseverance, and professional pride from Brunelleschi.

Mr. Beckwith Spencer, who proposed a vote of thanks to Professor Pite, said he wished as a layman in architecture to say how greatly he valued a lecture on Brunelleschi from a practical man. Many writers were often in error regarding architectural facts, so that one became often sceptical of books and placed more value on lectures from an architect with inside knowledge. The description of the spaciousness of the Italian churches had interested him, and he wondered whether Gothic architecture was introduced into Italy for a deliberate purpose. They knew that it was introduced by the Franciscans, who were popular preachers, and they could quite understand that the old style of churches did not provide for them adequate accommodation. They wanted churches with unencumbered space, churches where people could see and hear, and so they introduced the new Gothic style from France, but it was never fully adopted in Italy. As to Brunelleschi himself, the time was a period of transition in Gothic and the style of the grand old manner of building, and Brunelleschi was the decisive factor in architecture as Giotto was in painting and Donatello in sculpture. It was valuable to know the cause for the revival of the dome in building was æsthetical and constructional, and it was also one of the points in a lecture on Brunelleschi which an architect could expound to students.

Mr. Walter Cave seconded the vote of thanks, and said the great point which Professor Pite had emphasised in his lecture was the individuality of Brunelleschi and how he appeared to connect the Gothic work with the Classical and the Renaissance. He did not think the Gothic work ever took hold in Italy, and like so many other things it did not live, since it was true that anything which came from the West to the East rarely succeeded. Art came from the East and worked its way to the limits of Europe, but the Gothic style was going back when it went to Italy and so was doomed to failure. The connecting link between Spain had been most clearly shown, and so too it had been proved that the Classical dome was built on Gothic lines. Wren at St. Paul's started away on a new principle and left Gothic alone.

Mr. H. H. Statham said Brunelleschi was a man who combined enthusiasm with a strong practical knowledge and feeling for construction, but it was remarkable to hear of the requisite care he took in putting ties all round his dome. He had wondered why with an octagonal base Brunelleschi did not try making a circular plan dome with small pendentives at the angles, since it would have been easier construction. He wished to ask Professor Pite if there was any information as to the exact way one course was put upon another, for when he thought of the great octagonal dome he was rather curious to know how Brunelleschi managed to erect it without scaffolding. Another point which struck him in seeing the illustrations of the large doorways was the delicate restraint in which the mouldings were handled and the absence of the usual projections seen in Classical cornices.

Mr. Alan Potter said the problem of the dome overshadowed the whole of Brunelleschi's life, and until two years ago the construction of the dome without centring was quite a mystery. The suggestion then made, which seemed to be a practicable one, was that the inner shell of the dome was the permanent centring of the dome, and just as a circular dome on plan was built so to speak on a double arch and ring, so Brunelleschi constructed the eight sides of his dome on eight flat arches, that was horizontally, which would create a thrust at the angles, and to counterbalance that thrust he placed large buttresses, which were really the buttresses of the shell and not ribs, as was so often stated. Professor Pite had dealt with Brunelleschi's studying in Rome. One thing which struck the speaker on that point was that he went to Rome with an intention, an ambition to dome the cathedral at Florence, and the difference between going to study with a definite instead of a general intention was very great indeed, and he must have given his time chiefly to the study of construction. The speaker wondered if in his study of the Pantheon the effect of the portico afterwards influenced Brunelleschi's design in Florentine churches.

Mr. H. P. G. Maule said he supposed they were all agreed that Brunelleschi was one of the greatest of the known architects, and from the lecture they had just heard they might conclude that the architecture of all great architects was one of construction and not of scenery. The more they studied the history of architecture and the great works of the past the more they realised that so far as their education as architects went it must be a matter of construction.

Professor Pite briefly replied to the vote of thanks and the meeting terminated.

## COLOURED RELIEFS AND MOSAIC.*

THERE are two methods of decoration especially suitable to wall surfaces of considerable area—mosaic and coloured reliefs. The first, indeed, cannot be used to any advantage except over a considerable area; the second, it is true, can be quite attractive in small spaces, such as an easel picture, but its proper use, its monumental use, is as a decoration of great panels or friezes on walls of a goodly size.

Apart from the details of design and execution there are such important considerations as to how they are best used and the sort of lighting and wall-surface which develop their special qualities in the best way. A wall which is to be covered with mosaic, for instance, does not need to be so well lit as one which is to be used for coloured reliefs, which more nearly approach the effect of a wall painting. In fact, there is no doubt that a mosaic if it contains much gold, which is the case in all the really splendid mosaics, wants very little light, and that from small and numerous windows. The small lights round the base of an apse, as in the case of San Marco in Venice, is perhaps the ideal result. San Marco altogether, with its numerous small windows, gives a most sumptuous effect of a mosaic interior, though the mosaics themselves are no better than in many other churches. The basilica-shaped church, as in Santa Maria Maggiore, Rome, or the two San Apollinare at Ravenna, does not give to mosaic the opportunity of showing its full beauty. This is rather an interesting fact, for as a rule one believes that a method of decoration is the servant of and is, as it were, the child of the style of architecture by which it is developed, and suits no other so well. But mosaic was for at least three centuries used as a decoration of basilicas only; the apsidal ends of these basilicas showed to the more sympathetic architects the peculiar suitability of curved surfaces for the expression of the true glory of mosaic. The result was the evolution of the Greek cross plan and the construction of such churches as San Vitale at Ravenna—which, however, was never covered as intended with mosaic—and San Marco. Curved surfaces and a dispersed illumination not too strong is the best to express the glory and mystery of mosaic. Also it should be considerably above the eye and in considerable quantity; when in small quantities it looks quite cheap, though it is not, and the effect is very trumpery. It is unfortunately quite considerably used for altar pieces nowadays. The "Last Supper," by Leonardo, is a favourite subject for this treatment, and the fact that such a great picture produces such an odious result is one of the clearest proofs of the great artistic law that a material in which a work is

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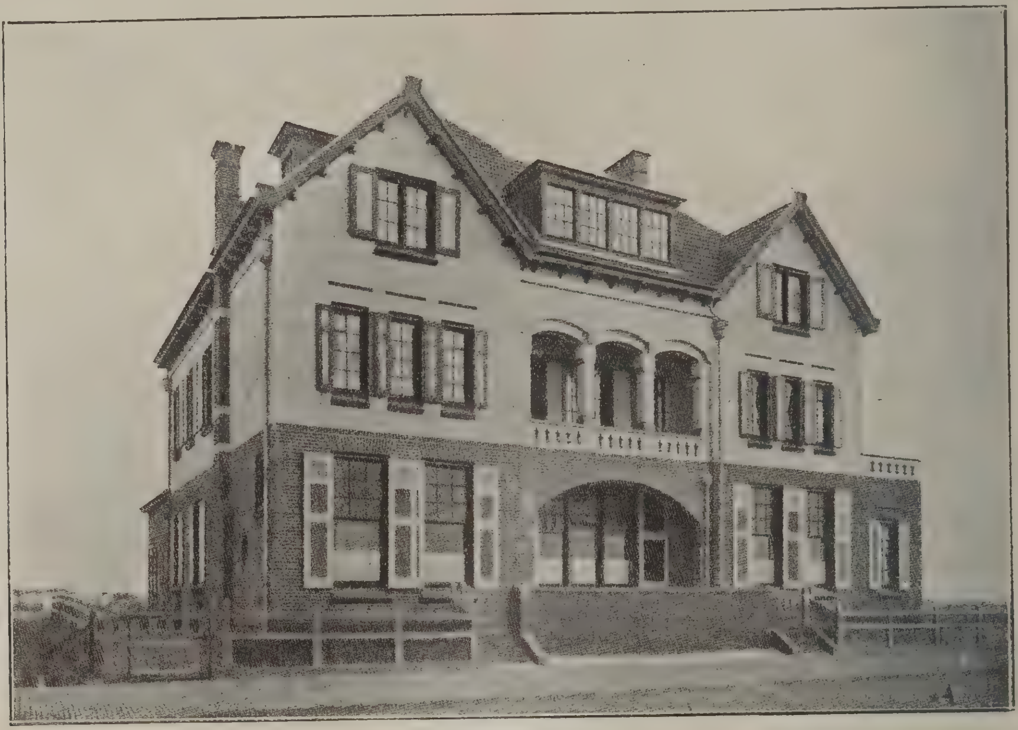
* Abstract of a lecture by Mr. R. Anning Bell, R.W.S., at Carpenters' Hall on March 23.

## MODERN EUROPEAN ARCHITECTURE.

### HOLLAND.



[From *Het Huis.*

VILLA AT ZANDVOORT.

executed must govern the design. Mouldings are to be avoided when mosaic is used as the decorative dominant factor. It can be taken round the windows, or from the wall on to the soffits of arches with the most charming effect; a glittering uneven gold line appears at the angles, this variation of the little pieces of gold giving the line a pleasant variety, and one which is obtained in the most natural way. In association with mosaic it is obvious that no other strong colour is wanted. Stained glass only fights with it, and painting is too weak. Coloured marble columns and panels with bronze and gilt metalwork seem to be the best treatment for the spaces below the mosaics; with them and on their own level nothing else can live.

For coloured relief a wider use is possible; it is not so dominating and will bear and be helped by the association of other forms of decoration. It can be placed low down, in which case it should be carefully wrought and highly finished; or it can be high up, when large planes of simple surface will have a good effect. In the former case the sculptor's work, the beauty of relief, will have much to do with its attraction; in the latter it is more a painter's work, the relief being used merely to give a greater strength than it would have if the surface were flat. It is remarkable how great is the superior carrying power of a slightly raised coloured surface at a distance when the fact that it is raised is imperceptible. But the resulting effect will be one of colour, and the success of the design will depend on the spacing and the colour.

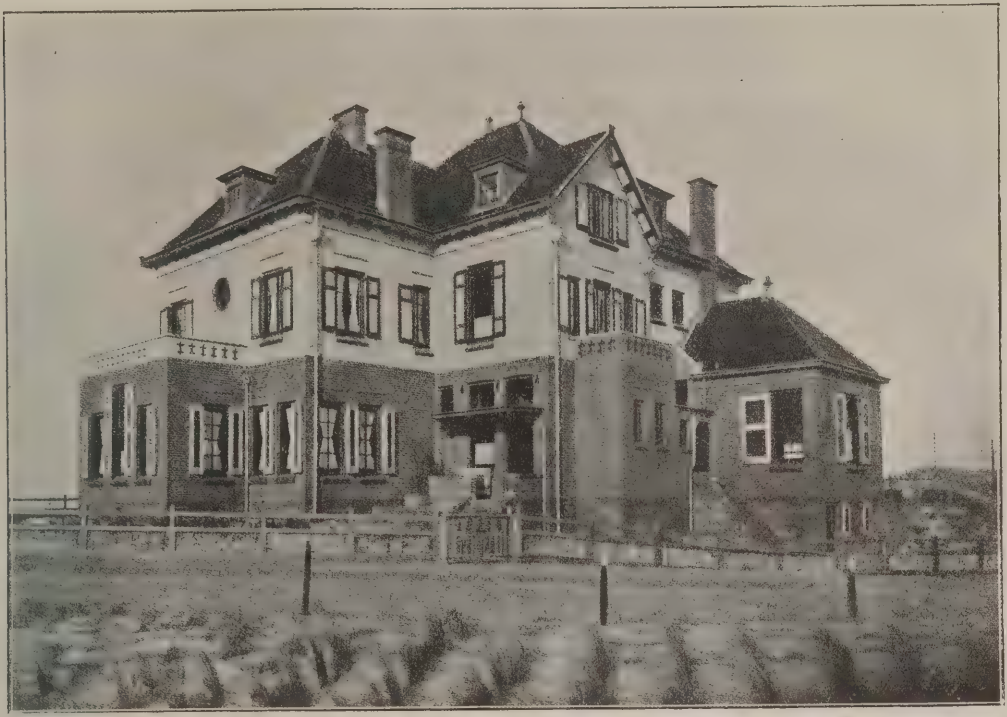
Coloured relief has not been so prominent a form of decoration as mosaic, and has not attracted the attention of such good masters. As a result, therefore, there is more fun to be got out of experimenting with it, and it is more likely to be a leading form of art in the future. Mosaic has had a great and long innings. It was the principal form of interior decoration for about a thousand years. From the second or third century to the thirteenth all the great schemes of interior decoration and some few, though they are not so successful, of exterior decoration are in mosaic. Very little fresco remains of those early years, and that is poor stuff. An art which has had such a history is not so likely to have a fresh outbreak of development as one which has been comparatively neglected.

Of course coloured reliefs of a sort are to be found all over the place. Every theatre and music-hall, almost every public-house, has them—of a sort. But one very seldom sees them nowadays done by men of personality, of original ideas; they are just pieces of ornament modelled by one set of men and coloured and gilded by another set; they are not modelled and coloured as one work under the control of one mind, they are usually chosen as modelling first and then coloured and gilded in rather a haphazard way afterwards. Now any colour scheme (any form of decoration, that is, in which the colour is the principal factor) must be designed in colour. A piece of modelling or a drawing of form coloured afterwards is but a timid experiment, or perhaps an overbold one. This does not mean that in happier days when there was a tradition in the arts it was impossible for one man to suitably colour another man's work in form; but then they had the experience—the workshop not the text-book experience, of generations to help them. They were all brought up in, were saturated with, the same style. Experience had taught them what sort of pattern suited this or that mouldin and what sort of colour arrangement suited the lighting and aspect and altitude of the work they were doing.

Let it be assumed that a definite space or spaces are to b treated with coloured relief. It is important that the subjec chosen should add to the significance of the building—for a church the story of the Bible or examples of moral nobility an steadfastness as exemplified by figures of the saints an martyrs. In a secular building, a town hall for instance, ar expression of the civic virtues and social duties, somethin to arouse the spirit of pride in the deeds of predecessors an to show that the individual is absorbed in the stream o municipal life, the great lesson of the subordination of th individual to the common welfare. For other buildings other subjects, each will suggest what is most fitting. Th subject settled, the next thing is to decide the scale of th figures or ornament and to get out a sketch of the whole worl in colour. This sketch is of course but a tentative thing t settle the destination of the colour and approximately wha the colour is, but water colour on a piece of paper canno accurately express the effect of work yet to be done on a raise scale; and as for the parts which are to be gilded, gold pain on paper gives but the slightest suggestion of it. Nevertheless the colour sketch is extremely important as the shapes o the masses of colour must be decided there if the colour used i the finished work may be changed. The colour sketch is practically a map just as the colour sketch for a stained-glas window is a map. And it is important to decide on the shape of the colour spaces beforehand in this map, because when yo get to the modelling, when the whole surface will be just sheet of clay of the same colour, the temptation to alter th design so as to get lines which are more agreeable, or seem a the moment to be more agreeable, is very difficult to resis

## MODERN EUROPEAN ARCHITECTURE.

### HOLLAND.



[From *Het Huis.*

VILLA AT ZANDVOORT

The lines which tell in the modelling, and which as a sculptor one is inclined to regard as of the greatest importance to the design, are not always the lines which are the effective ones in the finished work when coloured. Also it is the shapes rather than the lines which matter most at the end. In a relief one side say of a head will hold shadow and tell more definitely as an outline than the other which secures the light; but when the head is coloured the shadow tells but slightly, but the head as a whole tells distinctly against the background.

Parts where the flesh shows (heads and hands and feet and what not) are particularly awkward details to treat, and should be very definitely settled in the preliminary sketch. In the nature of the material these portions are sure to show rather distinctly if at all a rich or vigorous colour scheme is employed, so that slight alterations which in the clay only tend to improve the panel may, and often do, develop awkward little shapes and ungainly angles when the colour is applied.

Now having settled on the scale of the work and on the colour scheme, you proceed with the modelling in clay, either for plaster or a fired material. The relief will depend on the lighting of the position in which the work is to be placed, and its height up. It never needs to be very high relief to get the best colour effect; very high relief like work in the round has often been coloured, but the result seems to be much inferior to that obtained by a more reticent treatment. A very slight relief will make the work tell much more distinctly at a considerable distance than the boldest painting on the flat. For work which is high up very simple and well defined planes are all that is needed, and all that will tell. Subtlety of modelling on the surfaces would be quite wasted though when near the eye you cannot have the work too elaborate and careful. The great thing is to get the drawing good and the masses of colour well distributed.

The modelling is the part which takes the longest to do, and it is a most attractive and interesting part of the work. Altogether the making of a coloured relief is one of the most enjoyable forms of occupation possible. It combines the pleasures of designing good outline, modelling relief, with all the delight there is in varying the delicate planes, and the joy of sumptuous colour, combined with gold and silver if desired.

When the clay model is finished it is cast in plaster. If it is wished that the finished work be in a durable material it can be fired in lucent plaster, which will last for centuries if out of the reach of damp and rough usage. In either case the suction of the surface is stopped with white shellac. After the ground is thoroughly stopped, but not enough to make it shine, such parts as are required are gilded, whether to be left in gold or to be used as a ground for colour. After that is done and a few days allowed for it to set the colour may be commenced with. Ordinary artists' colours with wax may be used, white or paraffin wax dissolved in turps as a medium to stop the shine of the paint. Tempera can be used, but in that case the surface must not be washed or sprayed for a considerable time, while oil has the advantage that it may be washed a very short while after it is laid on. Of course anything approaching realism in the colouring is impossible, lurid tints being undesirable; it is an architectural decoration, and demands a man with the faculty of designing colour. In the application of the colour itself perhaps the best results are obtained by doing it in various stages —putting a colour on and wiping it off, and here and there from the more prominent parts; then when dry putting another colour over it and wiping it away so as to show the first coat here and there; sometimes using transparent colours, sometimes opaque, letting a colour lie in the crevices of drapery and applying another to the raised parts to get a better effect. There is no end to the variety to be obtained, and experience only can teach how much can be done. The treatment lends itself to any amount of elaboration. The effect of one plane surface of paint resembles that of those disagreeable little images of saints in ecclesiastical decorators' shops, images that have done a good deal to prevent the general use of colour with form nowadays. A broken effect of colour is necessary; but most necessary is the sense of colour. Pattern may be added to it, or anything else to make it more sumptuous and splendid; but the essential thing is to keep the colour in mind when doing the modelling. Arrange the folds of the drapery to hold shadows when it is desired to enrich the effect. Have little raised folds when it is desired to make light lines tell by wiping the colour off them. There are all sorts of ways of varying the surface in order to give the colour as much variety of quality as possible.

Strong colour is good, but no colour has its full brightness in this material as it has on a white canvas. This is because of the inequality of the surface on which it rests. One colour which is extremely useful and beautiful is black; blue is never very pure looking, somehow red tells very well. But the best results are got by combining strong colour with gold.

A mosaic decoration is composed of definite separate pieces of glass not varying greatly in size. Much of the old mosaic consisted of pieces of from $\frac{1}{4}$ inch to $\frac{3}{8}$ inch square; pieces larger than this latter are not common. The interstices between these pieces are an important element in the general effect, and can be used to gain some variety of quality to the surface by making them wider or narrower as may be desired, thus allowing the colour of the cement or putty, as it is called, in which the tesseræ are set to affect the general colour. This all-over quality given by the interstices naturally makes for a certain monotony in texture, and is one of the reasons why mosaic is unsuited to anything approaching realism. It gives a certain flatness which is eminently agreeable in a decorated wall surface and one which seems to demand a certain austerity or stiffness in the design. The florid works of the later masters all look as if they were executed under protest, as it were, and were substituted against their will for a more fluid and facile method, such as oil paint. They miss the attraction proper to mosaic, and what attractions they possess are obtained in spite of instead of with the help of the material used. These remarks apply to work designed by some of the greatest artists who ever lived, such as Titian, Tintoretto, and Raphael. The effect of flatness is assisted by the fact that the colour masses in mosaic do not look so strong as the colour of the individual pieces of glass would lead one to expect. This is partly because of the interstices, partly because of the tesseræ not lying absolutely smoothly, though this has been achieved with lamentable results—and being made of glass the surface of some few of them is sure to reflect the light somewhat at whatever angle you stand to them. An additional reason is that the tesseræ being many of them more or less transparent themselves hold a little shadow from the piece above or from the putty which lies between. Whether the shadow is above or below or at one side depends of course on where the lighting comes from. The slight shine on the surface of parts naturally affects the warm colours more than the cool ones, which lose comparatively little.

After a sketch has been made giving the general design and colour scheme, cartoons are made of the actual size of the work. These are coloured, and often the tesseræ are marked on them or at least on parts of them, showing the direction in which the lines of tesseræ are to go, a very important consideration, and one which affects the merit of the result enormously. These cartoons may be made any way—oil, water colour, pastel, or tempera. Pastel has the advantage that any colour may be exactly repeated, but it gets badly knocked about on the scaffold if the work is done *in situ* and from the front. On the whole water colour seems to answer best. When the cartoons have been made there are two methods of executing the work. The quickest is to lay the cartoons on a flat table and to match the colour with the tesseræ, laying them face down on the cartoons on the spot of colour they match. When the whole cartoon is done in this fashion, or a sufficient amount of it not to be too unwieldy, cement is spread over the tesseræ and a slab of slate placed over the whole; when set this is taken up and turned round and the finished mosaic is seen on the front. This is a quick and straightforward method, but its disadvantages are that you can never see the front until the work is finished and unalterable, and that there is an unpleasant smoothness in the surface (though it is true there are various tricks in use to modify this), and also that as the work is done in rectangular slabs usually of the same size it is possible that they may show when placed *in situ*. A most disastrous instance of this is to be seen in what must have been one of the most magnificent of the old mosaics in the Lateran Church at Rome, where the great apse is quite ruined.

The other way is longer and therefore more expensive, but it is much more interesting, and it is possible to see what is going on and to make any alterations which may seem advisable—alterations in colour, in size of tesseræ, in width of interstices, or in direction of lines of tesseræ, which latter often occurs. The wall on which the work is to be placed must be dry and with sufficient roughness to form a key for the cement or putty. The wall is soaked well with boiled oil, and after a day or two the putty is applied to as much of the surface as is expected to be covered before the putty sets hard. On this is picked out from a tracing the portion of the cartoon intended for it. Then the worker, with the cartoon behind him and his tray of tesseræ at hand, commences matching the colours and pasting the tesseræ into the putty side by side usually showing the cut edge not the front of the piece.

Something should be said as to the cement or putty. Portland cement is often used, but there are various mixtures of a more slowly drying nature. An early formula gives a simple admixture of slaked lime and Tibertine marble dust in the proportion of one to three. Sometimes a little linseed oil was used. A formula accepted by the later workers after the Renaissance was powdered travertine 60, slaked lime 25, raw linseed oil 10, boiled linseed oil 6. Care should be taken in exterior work to use a mixture which will not be affected by the heat.

Naturally the skill of the executants varies a good deal, and as it is not possible to reproduce exactly in glass the colour of pastel or water-colour on paper a great deal will depend on the taste of the individual. For this reason, if for no other, it is best to work from the front, as then the designer can keep in constant touch with the workers and can talk things over with them whenever any difficulty comes up.

Mosaic is the most splendid and the most permanent form of wall or ceiling decoration. But its limitations must be studied and respected or it will exact a terrible revenge. With the exception of stained glass no decoration can be more satisfactory and delightful when properly used, and nothing more overwhelmingly disastrous when forced beyond its scope.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) makes a special feature of Mr. Wm. H. Goodyear's sixth paper on "Illustrations of the Widening Refinement in the Architectural Exhibition at the Brooklyn Museum," in which attention is directed to the church of St. Alpin, Châlons; the Balaban Aga Mesjid Mosque at Constantinople; the church of St. Loup, Châlons; the church of St. Ouen and the cathedral at Rouen; the cathedrals at Rheims, Amiens, and Laon; and the main doorway of St. Mark's, Venice.

*La Construction Moderne* (Paris) has in recent issues illustrated the successful designs for the Rougevin prize in the Ecole des Beaux-Arts, a *cottage ornée* at Crozant by M. Henri Geay, and the centring for the new Pont du Moulin des Pierres, over the Valserine.

*Der Architekt* (Vienna) confines its illustrations to the work of two architects, Professor Jan Kotera of Prague and Mr. M. H. Baillie Scott. A charming little house, delightfully situated, of which Professor Kotera is the architect, is the villa for Dr. Tonder at St. Gilgen.

*Het Huis* (Amsterdam) continues its account of Oud-Deventer, giving some excellent illustrations of the seventeenth century work thereat. A new town house at Dordrecht is also illustrated and some of the treasures of the museum at Zutphen.

*Arkitektur og Dekorativ Kunst* (Christiania) gives a description and several views of the exhibition buildings at Aarhus by the architect Carl Berner, the design of which is based on a variety of sources of inspiration from Greek Doric to the *dernier cri* in *art moderne*.

*Industrial Engineering* (New York) gives an account of the hypocaust heating of the workshops of the Morse Chain Company, Ithaca, New York, which is described as "a radical departure from the usual methods." It is not particularly novel in modern work, as the Bourse at Vienna had an installation of a similar heating system a quarter of a century ago.

*Stone* (New York) illustrates the new Municipal Building, Pennsylvania Avenue, Washington, of which Messrs. Cope & Stewardson are the architects, and in the interests of stone shows several examples of the failure of concrete masonry in the church of St. John, Brooklyn, built ten years ago, thus offering a counterblast to the much-puffed Edison scheme of houses "poured while you wait."

The *Architectural Review* (Boston, U.S.A.) illustrates some small houses and two churches by Messrs. Cram, Goodhue & Ferguson, one in Texas and the other in Alabama. Views of Mr. Ernest Newton's house, Luckley, Wokingham, are also given.

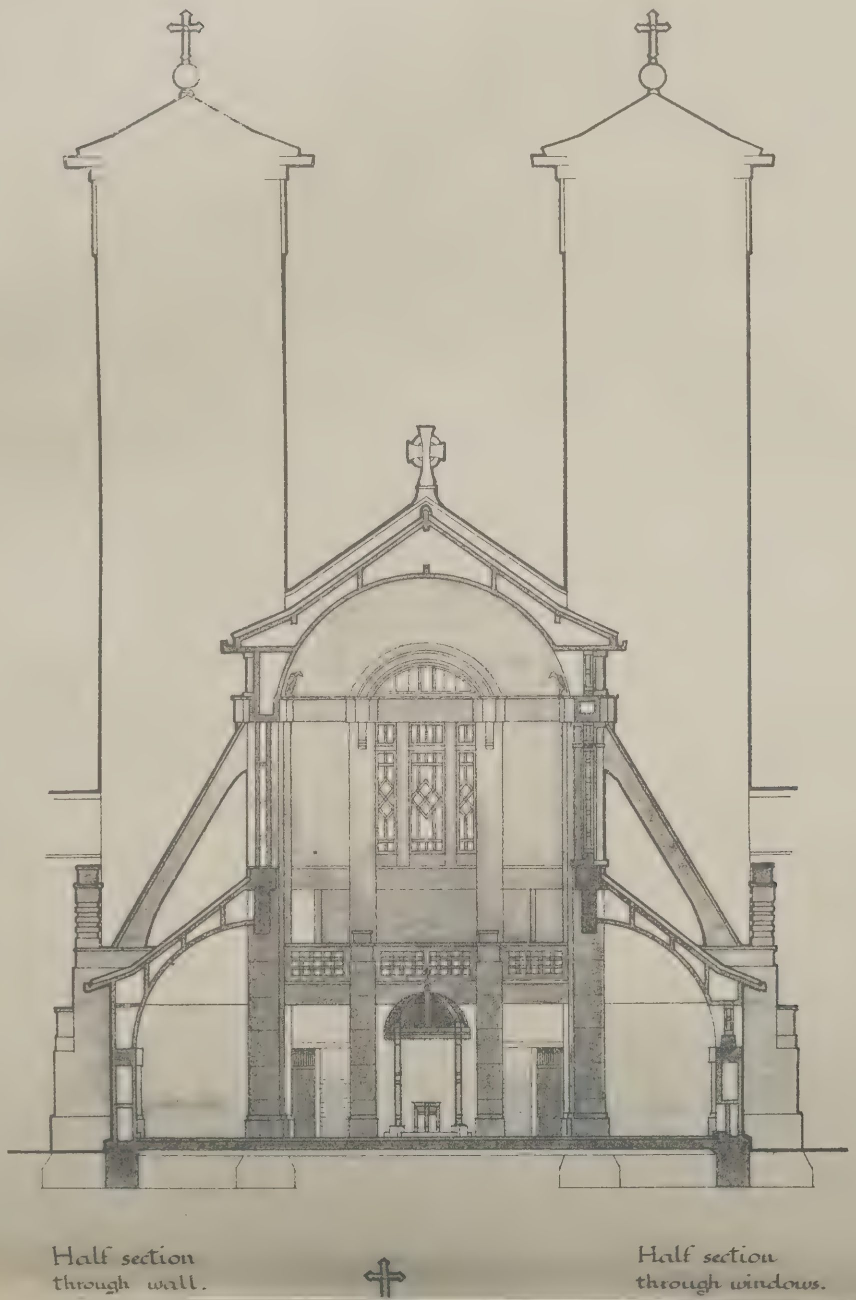
The *Scientific American* (New York) gives a number of views of the rock-cut buildings and ruins of Petra from recently taken photographs.

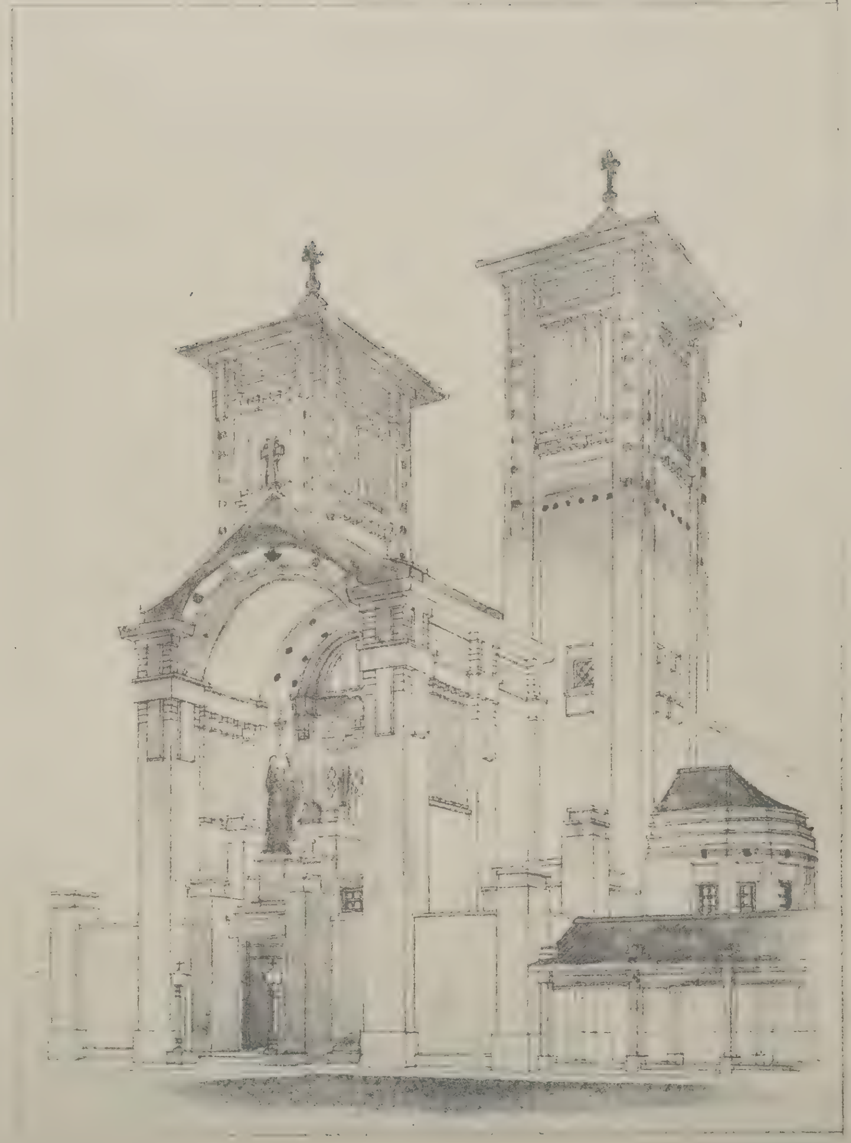
*Engineering Record* (New York) publishes a number of letters from architects who have specialised in mill buildings, expressing their opinion of the value of the practice of boring longitudinal holes, with cross ones for ventilation, through timber posts as a preventive of dry rot. The general opinion seems to be that the practice has no effect on the development of dry rot. A description with illustrations is given of the constructional steelwork of the New York Municipal Building, of which Messrs. McKim, Mead & White are the architects.

MR. JOHN GARLICK, of Berkeley Lodge, Ashtead, and of Sloane Street, S.W., builder, who died on February 16, aged seventy-four, left estate of the gross value of 88,863*l*. 10*s*. 5*d*., of which the net personalty has been sworn at 39,240*l*. 9*s*. 2*d*.

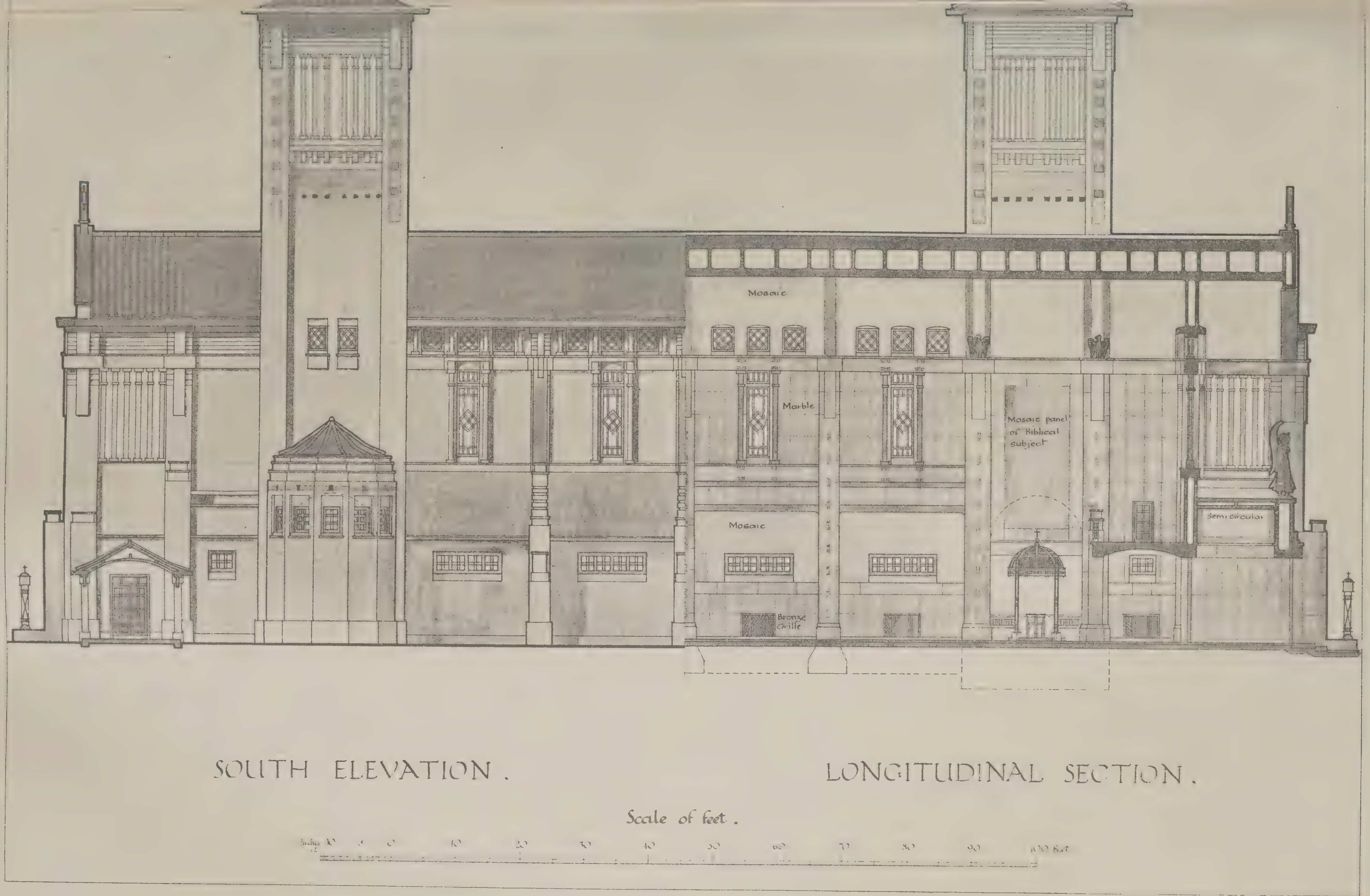
SINCE the passing of the new American Tariff Act, providing for the free entry of works of art over twenty years of age, and antiques over 100 years old, the value of the exports from Britain to the United States has materially increased, the American Vice-Consul-General in London reports. During August, September, and October of 1908 the value of art and antique exports was 75,153*l*., but during the same period of 1909 the value of the exports rose to 1,339,516*l*.

# A CHURCH IN REINFORCED CONCRETE.





PERSPECTIVE.



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DESIGN FOR GRISSELL GOLD MEDAL 1910. BY MR. FRANCIS H. MORLEY.

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# A CHURCH IN REINFORCED CONCRETE.

### MATERIALS_ EXTERIOR.

The concrete to be buff coloured and to have marble chippings of various colours in the aggregate.

Centering struck after 24 hours & the face wire brushed whilst green

Bronze copings to piers and beams

Windows in red marble glazed with silver white Norman slab in the bronze casements.

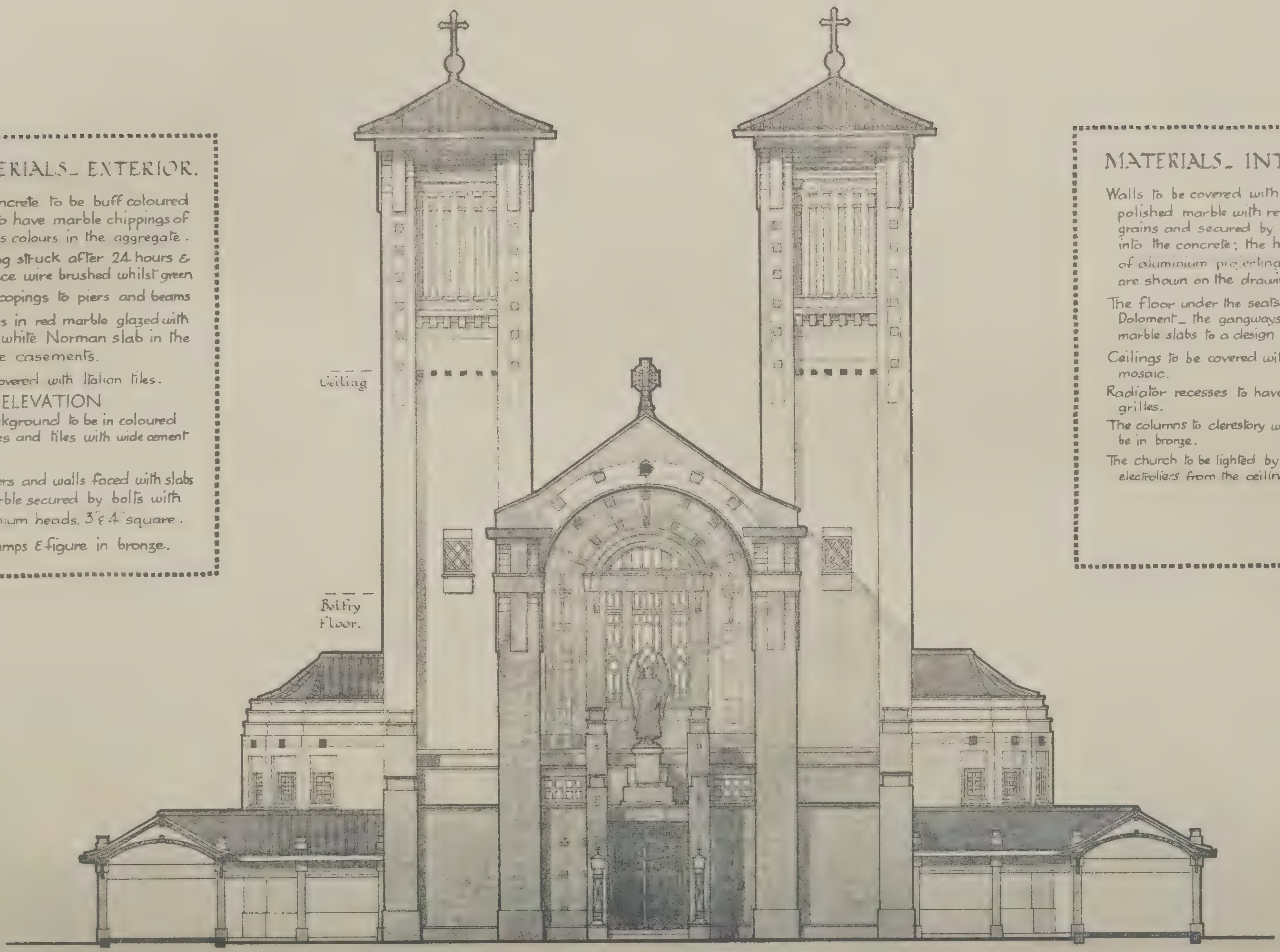
Roofs covered with Italian tiles.

WEST ELEVATION

The background to be in coloured marbles and tiles with wide cement joints

Inner piers and walls faced with slabs of marble secured by bolts with aluminium heads. 3" & 4" square.

Doors, lamps & figure in bronze.



### MATERIALS_ INTERIOR.

Walls to be covered with slabs of polished marble with reversed grains and secured by bolts let into the concrete; the heads to be of aluminium projecting where they are shown on the drawing.

The floor under the seats only to be Doloment_ the gangways in polished marble slabs to a design

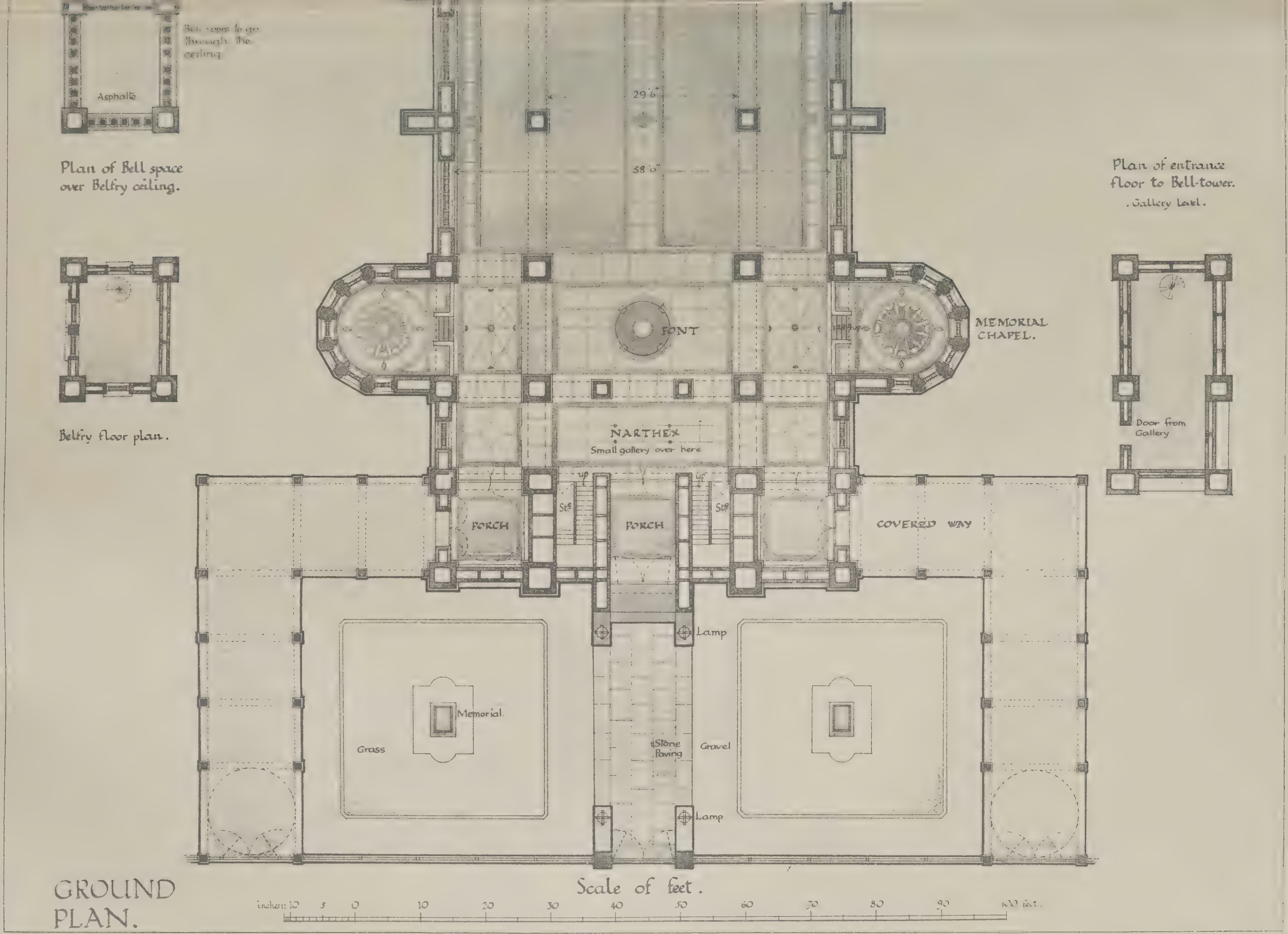
Ceilings to be covered with glass mosaic.

Radiator recesses to have bronze grilles.

The columns to clerestory windows to be in bronze.

The church to be lighted by large bronze electroliers from the ceilings.

ELEVATION OF WEST END.



INK PHOTO SPRAGUE & C° L™ 4 & 5 EAST HARDING STREET FETTER LANE, E.C

**Design For Grissell Gold Medal 1910.** By Mr. Francis H. Morley.

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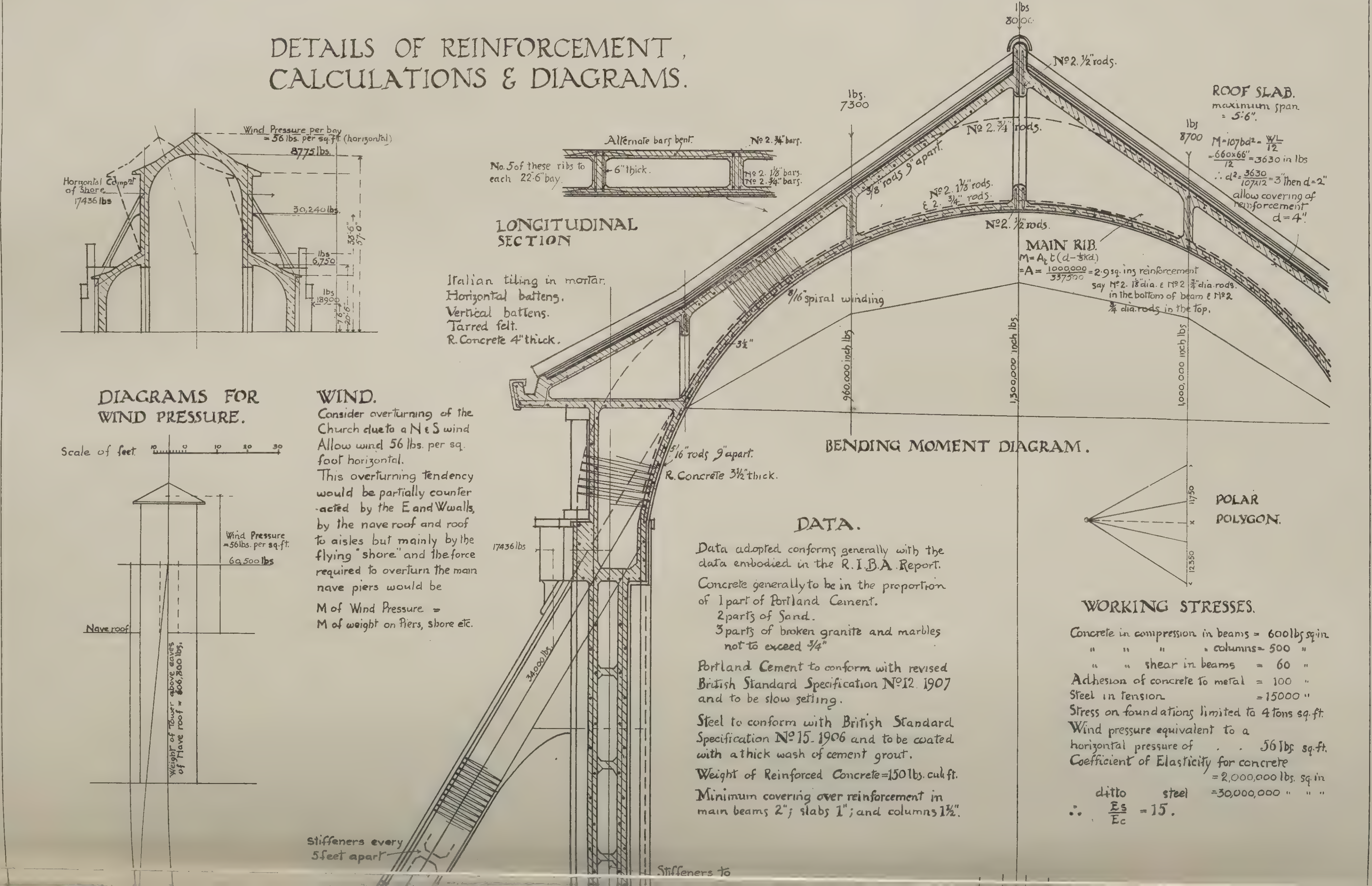
# A CHURCH IN REINFORCED CONCRETE

## DETAILS OF REINFORCEMENT, CALCULATIONS & DIAGRAMS.



**ROOF SLAB.**
maximum span = 5'6".

$M = 107bd^2 = \frac{WL}{12}$
$= \frac{660 \times 66''}{12} = 3630$ in lbs
$\therefore d^2 = \frac{3630}{107 \times 12} = 3''$ then $d = 2''$
allow covering of reinforcement
$d = 4''$.

**MAIN RIB.**
$M = A_t t(d - \frac{1}{3}kd)$
$= A = \frac{1000,000}{337500} = 2{\cdot}9$ sq. ins reinforcement
say No 2. 1⅛" dia. & No 2 ¾" dia. rods. in the bottom of beam & No 2 ¾ dia. rods in the top.

### WIND.

Consider overturning of the Church due to a N & S wind. Allow wind 56 lbs. per sq. foot horizontal.

This overturning tendency would be partially counteracted by the E and W walls, by the nave roof and roof to aisles but mainly by the flying "shore" and the force required to overturn the main nave piers would be

M of Wind Pressure =
M of weight on Piers, shore etc.

### DATA.

Data adopted conforms generally with the data embodied in the R.I.B.A. Report.

Concrete generally to be in the proportion of 1 part of Portland Cement.
2 parts of Sand.
3 parts of broken granite and marbles not to exceed ¾"

Portland Cement to conform with revised British Standard Specification No 12. 1907 and to be slow setting.

Steel to conform with British Standard Specification No 15. 1906 and to be coated with a thick wash of cement grout.

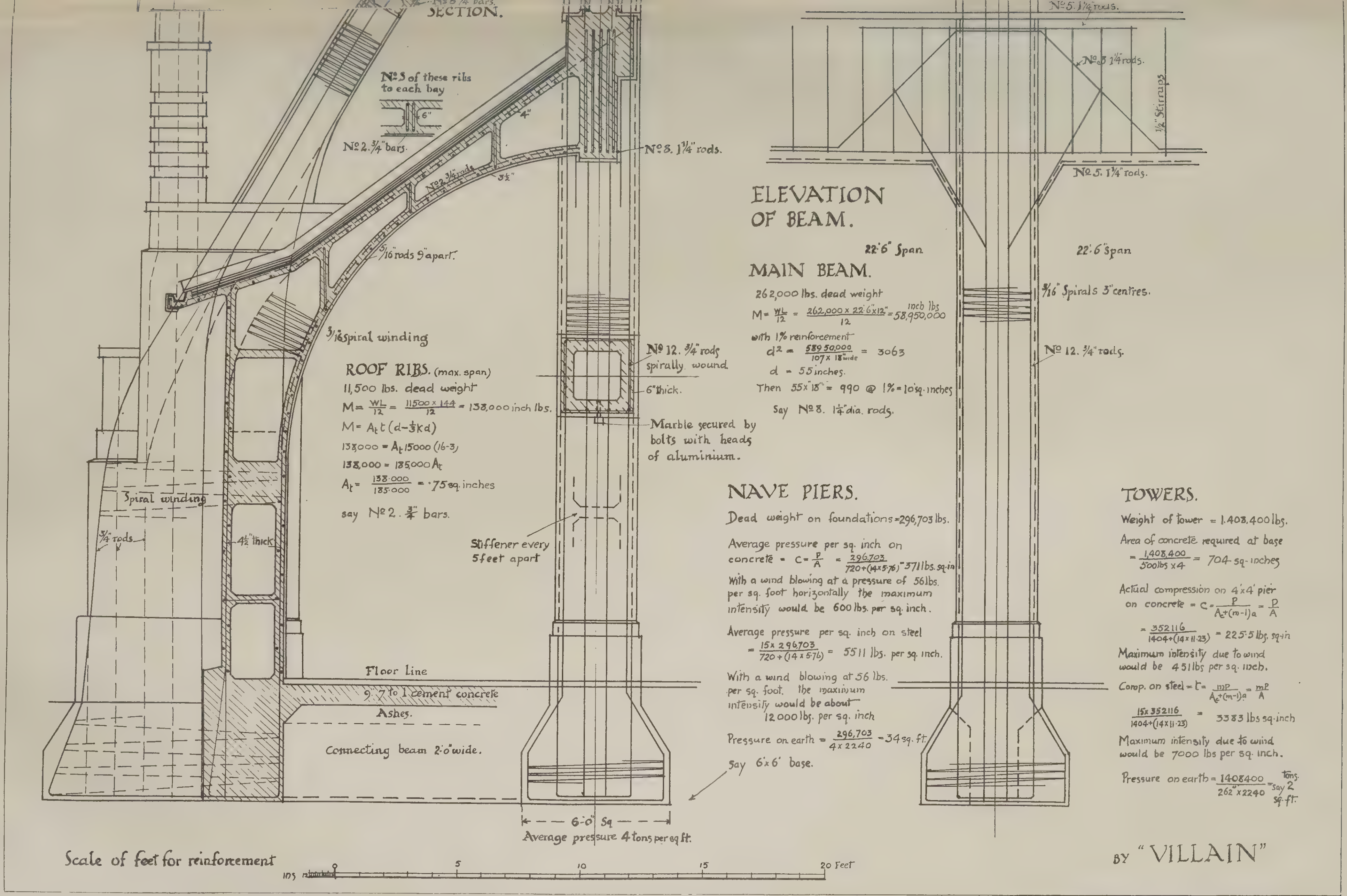
Weight of Reinforced Concrete = 150 lbs. cub ft.

Minimum covering over reinforcement in main beams 2"; slabs 1"; and columns 1½".

### WORKING STRESSES.

| | | |
|---|---|---|
| Concrete in compression in beams | = | 600 lbs sq in |
| " " " columns | = | 500 " |
| " " shear in beams | = | 60 " |
| Adhesion of concrete to metal | = | 100 " |
| Steel in tension | = | 15000 " |

Stress on foundations limited to 4 tons sq. ft.
Wind pressure equivalent to a horizontal pressure of . . 56 lbs. sq. ft.
Coefficient of Elasticity for concrete = 2,000,000 lbs. sq. in
ditto steel = 30,000,000 " " "
$\therefore \frac{E_s}{E_c} = 15.$


SECTION.
Nº 3 of these ribs to each bay
6"
Nº 2. ¾" bars.
4"
3½"
Nº 2. ¾" rods
5/16" rods 9" apart.
3/16 spiral winding
Spiral winding
¾" rods
4½" thick
Floor line
9" 7 to 1 cement concrete
Ashes.
Connecting beam 2'0" wide.
Nº 8. 1¼" rods.
Nº 12. ¾" rods spirally wound
6" thick.
Marble secured by bolts with heads of aluminium.
Stiffener every 5 feet apart
6'0" Sq
Average pressure 4 tons per sq ft.
Nº 5. 1¼" rods.
Nº 5. 1¼" rods.
½" Stirrups
22'6" Span
22'6" Span
5/16" Spirals 3" centres.
Nº 12. ¾" rods.
Scale of feet for reinforcement
Ins 0 5 10 15 20 Feet

## ELEVATION OF BEAM.

## MAIN BEAM.

262,000 lbs. dead weight

$M = \frac{WL}{12} = \frac{262,000 \times 22'6" \times 12"}{12} = 58,950,000$ inch lbs

with 1% reinforcement

$d^2 = \frac{58950,000}{107 \times 18"\text{wide}} = 3063$

$d = 55$ inches.

Then $55" \times 18" = 990$ @ 1% = 10 sq. inches

Say Nº 8. 1¼" dia. rods.

## ROOF RIBS. (max. span)

11,500 lbs. dead weight

$M = \frac{WL}{12} = \frac{11500 \times 144}{12} = 138,000$ inch lbs.

$M = A_t t (d - \frac{1}{3} kd)$

$138,000 = A_t 15000 (16-3)$

$138,000 = 185,000 A_t$

$A_t = \frac{138.000}{185.000} = \cdot 75$ sq. inches

say Nº 2. ¾" bars.

## NAVE PIERS.

Dead weight on foundations = 296,703 lbs.

Average pressure per sq. inch on concrete $= C = \frac{P}{A} = \frac{296.703}{720 + (14 \times 5\cdot 76)} = 371$ lbs. sq. in

With a wind blowing at a pressure of 56 lbs. per sq. foot horizontally the maximum intensity would be 600 lbs. per sq. inch.

Average pressure per sq. inch on steel $= \frac{15 \times 296,703}{720 + (14 \times 5\cdot 76)} = 5511$ lbs. per sq. inch.

With a wind blowing at 56 lbs. per sq. foot. the maximum intensity would be about 12 000 lbs. per sq. inch

Pressure on earth $= \frac{296,703}{4 \times 2240} = 34$ sq. ft.

Say 6'×6' base.

## TOWERS.

Weight of tower = 1.408.400 lbs.

Area of concrete required at base $= \frac{1,408,400}{500\text{lbs} \times 4} = 704$ sq. inches

Actual compression on 4'×4' pier on concrete $= C = \frac{P}{A_c + (m-1)a} = \frac{P}{A}$

$= \frac{352116}{1404 + (14 \times 11\cdot 23)} = 225\cdot 5$ lbs. sq. in

Maximum intensity due to wind would be 451 lbs per sq. inch.

Comp. on steel $= t = \frac{mP}{A_c + (m-1)a} = \frac{mP}{A}$

$\frac{15 \times 352116}{1404 + (14 \times 11\cdot 23)} = 3383$ lbs sq. inch

Maximum intensity due to wind would be 7000 lbs per sq. inch.

Pressure on earth $= \frac{1408400}{262" \times 2240} =$ say 2 tons. sq. ft.

BY "VILLAIN"

4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR GRISSELL GOLD MEDAL 1910. BY MR. FRANCIS H. MORLEY.

# The Architect.

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## FORTHCOMING EVENTS.

*Monday, April* 18.

Royal Institute of British Architects : Paper on "The Architecture of Adventure," by Professor W. R. Lethaby, F.R.I.B.A.

Liverpool Architectural Society : Annual General Meeting.

Architectural Association : Play "Arctia" at the Royal Court Theatre, London. Also on Tuesday.

Royal Society of Arts : Mr. A. B. Searle on "Modern Methods of Brickmaking." (Cantor Lecture 2.)

*Wednesday, April* 20.

Guild of Architects' Assistants : Paper on "Art, Architecture, and the Assistant," by Mr. E. J. Dixon, A.R.I.B.A., at Bedford Head Hotel, Tottenham Court Road, W.C.

*Thursday, April* 21.

Concrete Institute : Paper on "The Effect of Sewage and Sewage Gases on Portland Cement Concrete," by Mr. Sidney H. Chambers, at the Royal United Service Institution, Whitehall, S.W.

Royal Society of Arts : Paper on "The Arts and Crafts of Tibet and the Eastern Himalayas," by Mr. J. Claude White.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

IN setting our students a water-colour sketch as the subject for March we realised that we were imposing a hard task, for few architectural students at an early period of their career can be expected to have attained proficiency in the use of water colour. This medium is, however, valuable to the architectural student as a means of training both his feeling for colour and his appreciation of mass and surface rather than line, a corrective that is particularly necessary to an architect whose daily work in an office leads him to attach too much importance and to become too much habituated to the representation of buildings by hard lines and flat washes.

Water-colour sketching is moreover a most enjoyable pursuit and relaxation for holiday times, fascinating in itself at the same time that it is a means of improvement for the architectural student. Hence we by no means regret that we have asked the members of our club to try their hand at water colour, and though the present results are not all worthy of being hung in the water-colour room of the Royal Academy exhibition, they in most cases give hope for the future, and we would exhort those who have made their first attempts on this occasion to persevere and steadily practise the art of drawing in water colour, so that when next we set a similar study we may be gratified by obvious improvement.

Those who have already attained some proficiency will not need to be urged to further efforts, as they have already, we doubt not, felt some of the pleasure that comes from the use of colour and brush in the delineation of architecture.

The tyro in water colour must at the outset put on one side all endeavour to reproduce all the detail that he sees and still more all that he knows to exist in the subject before him, which, by virtue of his architectural training, he is apt to suppose that he sees and to attempt to include in his drawing. It is almost impossible in a water-colour drawing to draw, for example, all the tiles that are on a roof, and even were it possible it would be undesirable. Elimination, therefore, must be one of the first principles, and selection must follow it. In a water-colour drawing it is not the number of bricks in a chimney-stack but their contribution of colour to the whole that counts. The architectural water-colourist should try to clear his mind of the knowledge that the building before him is constructed of brick, of timber, or of stone, and roofed with tile or slate or lead, but regard it as a collection of a vast number of patches or dots of different colours or tints of varied shapes.

Some of our students have been unable to forget that in the office drawings they always tint the windows blue, and so have done the same in their sketch, following in this as in other matters the conventional colours of working drawings. Another great fault also derived from office work is the use of flat washes. These must be avoided like the plague in water-colour sketching. There are no flat washes in any actual building even when it is brand new and fresh painted, and still less anything approaching a flat wash in the objects before us that are the work of nature and not of man.

One of the first things, therefore, to be learnt in the technique of water-colour painting is the laying on of washes that are not flat, but that approach somewhat to the infinitude of variation that exists in what is actually before us as we draw. Although a nearer approach to this infinitude may be obtained by stippling with many small points of colour, we should advise the architectural student in his earlier stages to avoid stippling and the use of a quite or approximately dry brush, and to rely on broad washes of broken colour, endeavouring to obtain the variation in the single wash rather than by repeated overlays or glazing of tint upon tint. When he has attained proficiency in the spreading of a broad single wash of broken colour then he can glaze this with other similar washes and pick out brilliant and strong points of colour, but even so the practice of glazing and stippling should always be very charily employed in water-colour sketching. The untouched wash left to dry as it falls from the brush is always more beautiful in a sketch than the painfully-worked-up imposition of tint upon tint, in glazing and stipple.

The beginner in water colour must not suppose that because he is attempting to paint, he need not therefore trouble to draw. Painting is drawing in colour, and perspective and form must receive as much careful attention when the drawing is in colour as when it is in black and white.

Chiaroscuro, the treatment of light and shade, must also be considered, and as a water-colour sketch usually takes some time, the artist has to be careful that he is not led into the error of painting part of his picture with the lighting that obtains at the beginning of his work and part as it is at the end. The sun often travels a considerable distance between the commencement of a sketch and its finish, and shadows at different angles give an absurd falsity to a drawing.

Tone and atmosphere are closely allied in painting. There should be careful study of gradation of tone, and as a general rule, though, like all rules, not without exception, strong tones are suitable for foreground and lighter ones for background. In this way a sense of atmosphere and distance is conveyed. The term "atmosphere" is one frequently used in the criticism of painting and means

SHIPTON HALL, SHROPSHIRE. (From "The Manor-Houses of England.")

the effect of the atmosphere in the modification of what we see. It applies not only to the strengthening or weakening of tone, but affects also the actual tint of colour, as, for example, a hillside near at hand may be strongly and even brightly green, but, viewed at a distance, becomes blue or purple.

Of the elementary principles of painting we have left to the last the most important—colour. In colour the temperament of the artist is most strongly expressed. Some men will never be skilful colourists, for it is not in them to appreciate the harmony of colours; but most of us have some sense of colour, and this is capable of development. When an architectural student sees before him something that pleases by its colour he must put on one side the conventions of the drawing-office and endeavour to see what actually are the colours before him, and by persistently so doing he will be surprised to find how many tints there are in buildings, even as in natural objects. He must not say to himself, " There is a red brick wall; I will put on a wash of Venetian red for that." If he looks carefully and closely he will find that his red brick wall requires quite a number of pigments from his box, yellows and browns, even blues and greens, as well as reds. Elimination and selection may be necessary, but once again the importance of broken colour must be enforced.

Space does not permit us to say all that might be said on the subject of water-colour drawing, but, having explained some of its more important fundamental principles we recommend our students to bear these in mind, and, basing their work thereon, endeavour by constant and assiduous practice to improve their technique and facility. We can assure them that they will obtain much pleasure, as well as an increase of their artistic ability, by continuing the pursuit of water-colour sketching.

We will now proceed with the criticism of the drawings we have received.

Mr. Stanley E. Minns must learn to avoid hardness and refrain from drawing lines in a water-colour sketch; at the same time careful drawing is important. One must not falsify perspective because colour is used. Mr. Minns's colour is not satisfactory, being too hard, and the preponderance of blue in the louvres of the tower of " St. Mary the Virgin, Cottingham, near Hull," is neither true nor pleasant.

Mr. Charles T. Whiteley has chosen a subject in " Stanley Palace, Chester," that would have made a good picture with more wise selection of point of view. As it is the red brick chimney-stack is the most striking feature. There is not sufficient carefulness in the drawing, while the colour is too monotonous and flat, particularly of the timber work. The light and shade is false. The tree rendering in particular requires more study and practice, but with these there is hope for Mr. Whiteley in the future.

" Sans Peur " sends four sketches, of which the best is that of the " Palace Eye, Wells." As a picture it is spoilt by the overhanging tree in the top left-hand corner, which would be better omitted. The colour of the other foliage does not harmonise well with that of the stonework, and in this some of the architectural detail is expressed with too much harshness. The " S.W. Tower, Wells," suffers from the hardness of the shadows in the tower, which should have been treated softly to give atmosphere and a sense of distance. The trees in their compromise between impressionism and literalness are marred by the treatment of the timber, trunks and boughs. A tree does not present so much of its skeleton structure in front with all the foliage behind, but is a more or less round object. The " Old House, Wells," by " Sans Peur," has also too much harshness in the drawing of the woodwork of windows, though the treatment of the wall surfaces is good. The cobble stones are too much in evidence. One does not want in a water-colour sketch to be told exactly how many stones there are in the paving. In " All Saints Church, Newcastle-on-Tyne," a stronger treatment of the sky would have been an improvement, and a judicious grey tone would have softened down the harsh silhouette of the tower and of the chimney-stack on the right.

Mr. Reginald Pywell has contributed two sketches, one of " Lyminster Church " and one of " Rustington Church," both in Sussex. The chief fault of Mr. Pywell' work is the use of too dry a brush, so that his colour look woolly instead of being full and luscious. His foreground are not sufficiently-strong. There is also too much uni

RAM HALL, WARWICKSHIRE. (From "The Manor-Houses of England.")

formity of a rather unpleasant blue tint in his windows. This is particularly noticeable in the sketch of Lyminster.

Mr. B. J. Mendham's sketch of "Aston Hall" is commendably bright and sunny, but his treatment of the foliage of the hedge leaves much to be desired, and would be better if more broadly washed in. There is too much sameness of tint in the windows, and the roof of the further tower is too strong in colour.

"Esek" is a skilful water-colourist, and sends us a charming sketch of the "Entrance to Tower, Bolton Abbey, Yorkshire," which is an accurate and informative representation of the architectural detail of his subject and at the same time a delicious study of colour.

"Nelson" has fairly well treated the building he represents, known as "The Tower," near Mold, though his perspective drawing leaves somewhat to be desired; but he is sadly lacking in ability to represent foliage in colour, while a flat wash of blue sky with hard edges intended to represent cloud form hopelessly kills the picture. The artist should take as much, if not more, care and trouble over the constituents of his picture other than the building as he bestows on the latter. "Nelson's" washes are continued without break of colour over too much surface of paper.

Mr. Walter Benwell in his sketch of the "Tower of St. Mary's Church, Stoke-by-Nayland," has produced a bright and sparkling drawing, but only by means of harsh and impossible contrasts of black on white, or at least extremely dark colour on very light. He should leave his fine and small brushes at home and work for a time with a large one full of colour, getting variety into his surfaces and less white or almost white paper.

We have no hesitation in awarding the prize for March to "Esek," whose work is far superior to that of any other student.

## THE MANOR-HOUSES OF ENGLAND.

In the whole field of English architecture of the past there is scarcely a more interesting section than that of the manor-houses, which occupy a place intermediate between the mansion of the noble and the cottage of the peasant, and hence are of especial value to the architectural student of the present day, whose opportunity for the exercise of his art is more likely to occur in the homely house of moderate size than in the cathedral, the mansion, or the costly municipal building.

If there is one characteristic of our old manor-houses that is more outstanding than another, it is their homeliness. Each and all give us the feeling that they were built as a home for the family of the individual squire who brought about their erection, and often not only impressed upon his own house his own personality, but actually superintended the detail of its construction, as we are told of Squire John Jones in his eighteenth-century restoration of Chastleton.

Therefore we welcome such a charming presentation of the manor-houses of England as we have before us in the volume by the Rev. P. H. Ditchfield,* in which there are brought to our ken not only a number of characteristic and typical examples, but many little-known specimens of the indigenous art of our domestic architecture. And yet the full tale is not told, for to do this and to catalogue the whole wealth of England's country-side in manor-houses, let alone of similar homes not strictly manorial, would need a far larger volume than the book offered to all lovers of English art at the modest price of three half-crowns.

The scheme of the author's work is excellent. After some introductory chapters explanatory of the manorial system, which may be epitomised in its essence as a patriarchal scheme of communities, of which the lord of the manor was the head, recompensed by certain rights for his maintenance of the privileges of his tenants, Mr. Ditchfield, following an exposition of the development of plan, deals with manor-houses from the point of view of their materials of construction. This is peculiarly appropriate to the subject, for it connotes local distribution of type, which was always largely based upon and influenced by the local material, thus bringing about that sense of harmony with its environment that is so characteristic of the design of the English manor-house. The adherence to the use of local material and the development of local type of design were no doubt in part due to the comparative isolation of various districts by the lack of facilities for intercommunication. As the author says:—"Villages or districts were self-centred, owing to the difficulties of communication and transit, and different parts of the country preserved their own peculiarities little affected by what was being accomplished in other parts of the country outside their own little world. Some wrought in stone, others in brick, plaster, or timber, but the same underlying principle governed all—a wish to do their best with the materials nearest to hand."

Passing from the consideration of materials in general, with the description of many examples illustrative of their effect on design, we are treated to an account of the particular treatment of details: first, of the exterior, chimneys, porches and doors, windows, roofs and gables; second, of the interior, mantelpieces and fireplaces, staircases, panelling, ceilings, windows; third, of metalwork in lead and iron. In this section we are furnished with many sketches, to a large scale, of the details described, which make the book particularly valuable to the architectural student.

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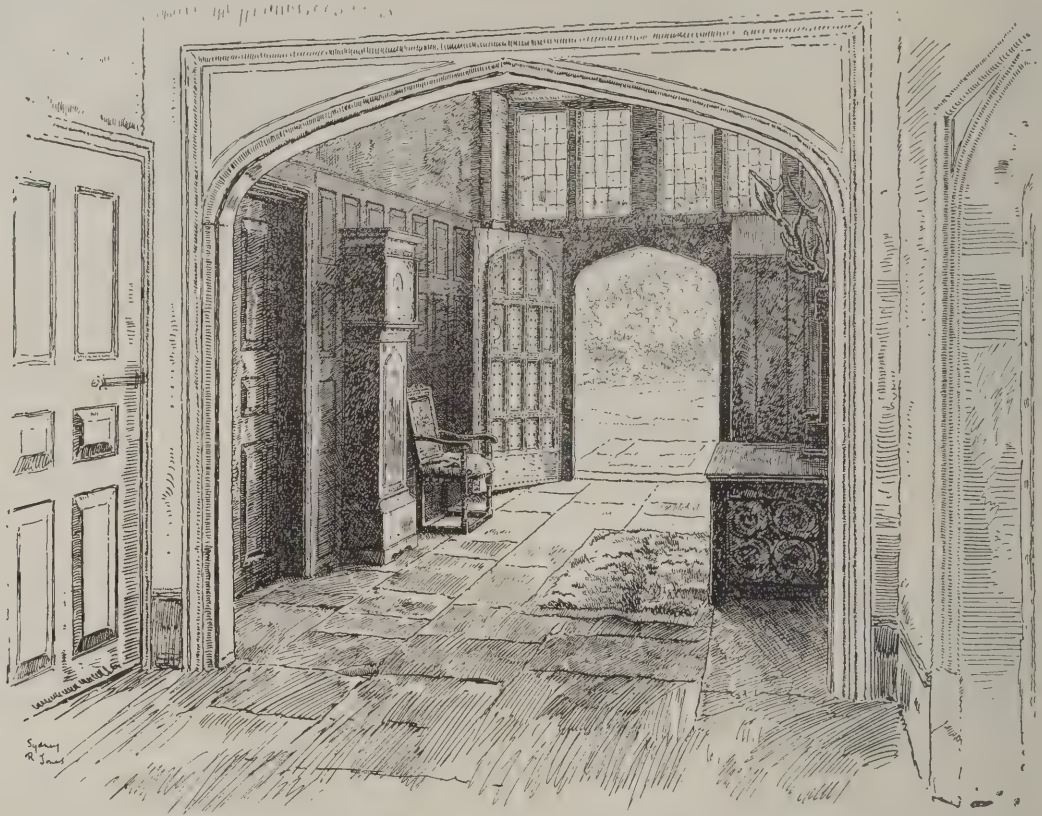
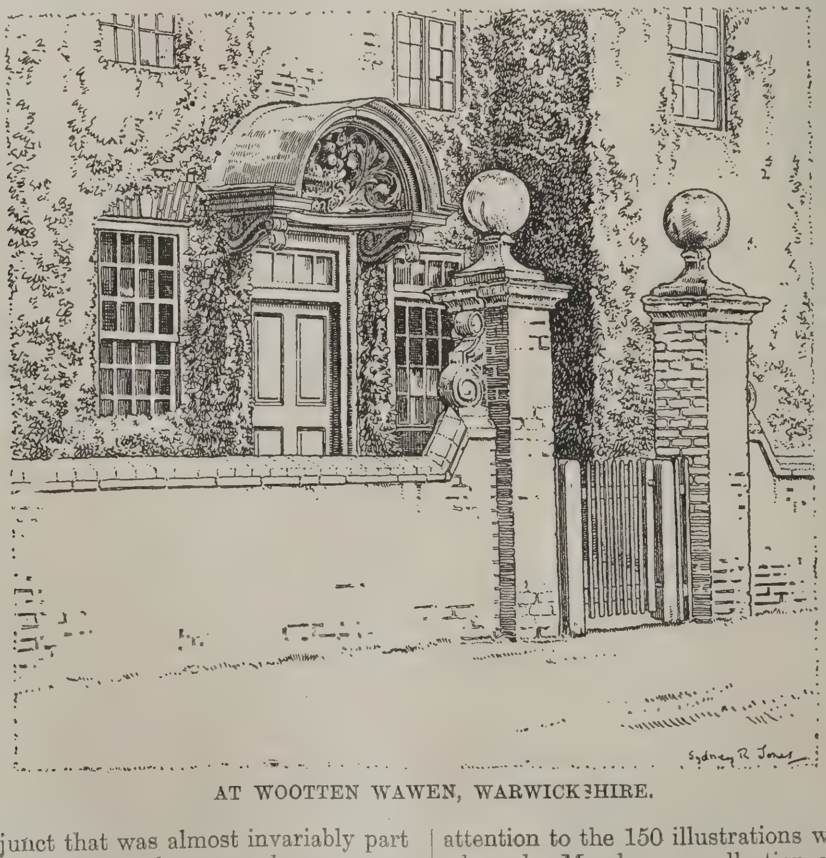
* *The Manor-Houses of England.* By P. H. Ditchfield, M.A., F.S.A. Illustrated by Sydney R. Jones. (London: B. T. Batsford, 1910. 7*s.* 6*d.* net.)



THE ENTRANCE HALL, WHITTINGTON COURT, GLOUCESTERSHIRE.

Finally, we have a chapter on gardens and their surroundings, an adjunct that was almost invariably part of the scheme for a home that the manor-house represented, and although with the degradation that has too often reduced a manor-house to a farmhouse, many of the old gardens have fallen into decay, it is, as our author tells us, "easier to discover a good manor-house garden than one attached to a more magnificent mansion."

The manor-house gardens, more often than those of lordly mansions, escaped the wild mania for landscape gardening which permitted the efforts of "Capability Brown" and other revolutionists to destroy the old pleasance.



AT WOOTTEN WAWEN, WARWICKSHIRE.

We cannot conclude our review without calling special attention to the 150 illustrations with which this book is adorned. Merely as a collection of admirable specimens of pen-drawing the volume is worth many times its price to the architectural draughtsman who desires to attain proficiency in this branch of his craft, for Mr. Sydney

JONES has proved himself one of our ablest present-day exponents of the use of pen and ink in the delineation of architecture, and has here given many delightful examples of his skill. By the courtesy of the publisher, Mr. BATSFORD, we are enabled to reproduce some specimens of the illustrations which assist to render the monograph on "The Manor-Houses of England" one of the pleasantest additions to the library of every lover of our native architecture that has appeared in recent times.

## NOTES AND COMMENTS.

THE incident of the alleged discovery of a signature on the famous Rokeby picture of *Venus*, discrediting the hitherto received ascription to VELASQUEZ, has once again demonstrated the absurdity of the fictitious and inflated values assigned to "old masters." It is beginning to dawn on the mind of the Philistine that the question, whether this particular picture is worth the 45,000*l*. for which it was purchased and presented to the nation depends on the accurate deciphering of certain cracks and scratches, is preposterous, and that the value of the painting as a work of art does not rest with the determination of its authorship.

IN the number of the *Art Journal* for April is an excellent appreciation by Mr. RUDOLF DIRCKS of the President of the Royal Institute of British Architects, Mr. ERNEST GEORGE, A.R.A., as a painter in water colours. Several capital reproductions from Mr. GEORGE'S sketches are given, and though these, of course, lose by translation into black and white their distinctive value of colour, it is remarkable what charming effect they convey in monotint, showing Mr. GEORGE'S mastery of values, his power of composition, and his fine sense of proportion in chiaroscuro.

THE Rev. R. T. S. TOLSON makes an appeal for funds for the preservation of the remains of the Oratory of St. Piran, in the parish of Perranzabuloe, on the north coast of Cornwall, which venerable sanctuary, he says, "must be one of the most ancient ecclesiastical buildings in the country, having been built by the Irish missionary St. PIRAN in the fifth century." Buried beneath an accumulation of sea sand some four hundred years later, it was discovered in the year 1835 and disinterred. Now by the exposure that has followed the removal of the protecting sand it has reached a serious condition of decay, to avert the further extension of which it is proposed to enclose what remains with walls and roof.

THE draft conditions of the forthcoming competition for the Usher Hall at Edinburgh provide for an expenditure of 65,000*l*., for which sum is to be built a hall to accommodate an audience of 3,000 persons with an additional 500 on the platform; crush-hall and lounge foyer, and other accessories. Designs are to be sent in by July 9, and copies of the particulars will be obtainable after April 18.

AT a meeting of the Southampton Cymmrodorian Society last week Mr. CHARLES COOKSEY advanced the theory that Southampton was the first Celtic capital in Britain, being known as Trisanton. The claim of Southampton to be the ancient Celtic city of that name was based upon historical, archæological, topographical, and philological evidence which existed in great abundance. He exhibited several excellent Celtic relics, and added that similar discoveries were constantly being made in and around Southampton. Amongst the exhibits were Celtic coins, a coin of ARBACES II., King of Parthia, about 225 B.C.; a shield brace, and the frontal of a skull found at a considerable depth quite recently during some excavations in the immediate vicinity of the buried Roman city of Clausentum, on the east bank of the river Itchen opposite Southampton. These, he explained, were only a small portion of the remarkable discovery of great deposits of human remains which had been unearthed during the digging of the foundations for a number of small houses which are now being built upon this extremely interesting, but much neglected site.

THERE were many references in the ancient chroniclers to events that took place in the large and important city of Trisanton. Here was buried the great King LUD, who first fortified the city and exercised much influence over the people, and whose name is preserved now in that of the old Celtic city of Ludgershall, in Wilts, on the borders of Salisbury Plain. This place was named after the great Celtic city of Lutetia, the original Paris, as Carisbrook in the Isle of Wight was from Cær Ebrauc, or Evereux, another ancient Celtic city upon the same river. Sir BEDEVRE, or BEVIS, according to the old British or Welsh story, sleeps on the wooded slopes of Trisan, now Portswood, and where his tomb remained till within the last fifty years, when the monument which marked the site on Bevois Hill, which overlooks the river Itchen and the Roman station of Clausentum, was destroyed, and his bones scattered.

ON his second invasion of Britain in B.C. 53, JULIUS CÆSAR sailed up Southampton Water, and after a sturdy resistance by the Britons took and destroyed Trisanton, but, beyond that, CÆSAR seemed to have done little by his second invasion, save to extract at the point of the sword a promise from the Britons to recognise the power of Rome by an annual payment, and upon this he withdrew. To avoid a repetition of this attack the Britons re-established their capital twelve miles further up the river Itchen, near the ancient oppidum known as Cær Gwent, now St. Catherine's Hill. Here, in the valley of the Itchen, they built their new capital, which they called Camelot, and erected a royal palace, where stand the ruins of Wallesey, or Wolvesley, Palace at Winchester. To protect the mouth of the Itchen they constructed a great defensive work at Woolston, considerable traces of which are still quite evident, and where within the last few years remarkable discoveries of bronze implements and Celtic coins have been made. This camp was referred to in the account of the invasion of AULUS PLAUTIUS in the year 43 A.D. as Cær Peris, or Byris, or Bere, which was corrupted to-day into Pear Tree Green. The Roman station of Clausentum later became the seat of the Roman power in this district, and it remained a city till the end of the Saxon period. Winchester continued to be the Celtic capital till the more thorough and effective invasion of VESPASIAN took place, which broke up the Celtic form of government and established that of Rome.

THE preservative works on Ayr Auld Brig, which have been going on more or less continuously for the last three years, have now been practically completed, and the bridge will again be thrown open to the public in the course of the summer. It was at one time thought that it would be necessary to rebuild the bridge, but it has been found practicable to preserve it as BURNS saw it, and so thoroughly and conservatively has the work been carried out that there is now practically nothing to show for the expenditure of over 11,000*l*. This is preservation of the right sort, much to be preferred to a conjectural restoration of what might have existed in the distant past.

THE Finance, Property, and Law Committee of the Heriot Trust have come to the decision not to adopt the proposals we gave some time back, as made by Treasurer LEISHMAN, for the adoption of some desirable, if a little Quixotic regulations for a considerable addition to the amenities in the future lay-out of their estates. The Committee appear to have been influenced to their decision by the feeling that the provisions of the Housing and Town-Planning Act, 1909, would do all that was desirable.

## THE CRAFT OF REPAIRING BUILDINGS.*

THERE is a striking difference between present-day views of architecture and the views taken by those living during any great period of building in the past. No people could have built so sumptuously as did our forefathers if they had not cared greatly for the work which was being done, and we know from the ruthless manner in which the Mediæval builders swept away or altered the work of their predecessors that they set no value upon it, but only on their own work. Architecture in those days was in somewhat the same position as electrical science is with us to-day. Everyone understood it more or less and everyone was in sympathy with it and everyone was watching its progress with keen interest. At the present time there *is* a little real architecture being done—a very little indeed when compared with the enormous amount of building which has been going on during the last fifty years—and even this little has not interested the public or the educated. No. It is only buildings of the past which now arouse interest and admiration. To know nothing about such buildings might almost be said to mark a man as uneducated. We can only hope that all this study will ultimately have a good effect on architecture whenever it does come to us, and it is clearly our duty to preserve the old buildings, at any rate until we can do something better ourselves. The mere fact of our caring so much about these old buildings is a proof that we are not producing a national architecture, because history shows that a people who are doing so do not care about anything except their own work. As matters stand it is, as I have said, clearly our duty to preserve the grand buildings left to us, and above all to preserve them in an authentic condition. This being so, I am justified in doing my best to lay before you such knowledge as I have on the way in which buildings can be made substantial without robbing them of the qualities which their makers gave them, and which we rightly value so highly.

Now let us consider why buildings need repair. Materials decay, but they do not decay without a cause. Snow and rain getting through roof coverings is one of the first causes. Timber decays by being wetted and dried, and mortar, bricks, and stone decay by wet, chiefly through frost expanding the wet by turning it into ice and thus forcing the particles asunder. Ivy destroys buildings by getting its roots into walls and forcing the stones apart and by covering the roofs and preventing the wet running off and the sun and wind from drying the roofs. This brings about the decay of the timbers and lathing. Another cause is the giving way of the ground on which walls rest. Such a result is generally due to the adjacent ground being disturbed, as for example by the digging of graves or sinking heating chambers. The ground giving way is of course a great danger to any building, and besides the causes I have named for this happening there is one most insidious one—viz. the water from the roofs being allowed to stagnate near the walls and soak into the foundations, thus making the ground soft and compressible.

A very common cause of failure in buildings is bad mortar. The old builders seem generally to have used local lime, and therefore you will find the *best walling* in the neighbourhood where the *best lime* is found. Where blue lias lime was procurable you will find instances, as for example the castles in Wales, where the mortar is as hard, if not harder, than the stone.

There is, however, one cause of decay which gives more trouble than any other. In years gone by it did not exist, and it has greatly increased in virulence since I have watched buildings. It is the surface decay of stone and mortar brought about by the enormous and wasteful consumption of coal at the present day. It is often thought that this only applies to town buildings, but it is not so, for the decomposing elements are carried by the winds and affect buildings miles away. Wood smoke does no harm.

We will now consider how these troubles can be overcome, and we will take a concrete example in Sutton-on-Trent church tower, which is in Nottinghamshire. It is a thirteenth century building with a later stage added. It had been in a critical state for a long time. Owing to bad mortar the core of the wall was like so much loose rubble and the walls were bulging and settling in spite of support being given by iron bands, and fissures were coming between the main walls and the angle buttresses. Both the architectural and engineering professions had reported that the only course was to pull down and rebuild. That is, to put modern workmanship in the place of ancient, so that the building, when finished, would not have been an old building. It is no disgrace that this advice should have been given, for those who gave it rightly said that it was dangerous even to pull it down. Mr. William Weir said he could repair the tower without rebuilding and he did so successfully. The walls were not only cracked on the face, but were splitting vertically in their thickness. What he argued was that the walls could not fall down if they could not fall outwards. He therefore began by planking the walls all over and connecting the opposite faces together by means of iron tie rods. Fortunately the original builders had worked with putlogs going right through the walls and this gave an opportunity of taking the rods through the walls without cutting holes, which might have been dangerous. When all this had been done the repairs were begun on the inside, starting at the ground level, for it was found that the foundations were quite sound. Loose stones were removed and the core of the wall taken out as far back as the outside facing stones. New work of brick and of concrete was put in to take the place of the old disintegrated work, and the backs of the outer facing stones were carefully bonded into the new work, care being taken to prop up the old work above the part being repaired. In one place the outer stone face had bulged so badly that it could not be bonded in as the work went up, so toothing was left and the bulged portion was rebuilt vertically and bonded into the toothing when the rest of the walls were finished.

This tower is sixty feet high and the walls four feet thick at the ground level, with a six-inch set-off at the first floor and another six-inch set-off at the belfry level, so that the fourteenth century top has three feet walls. The expense of doing the work was less than two-thirds the cost of rebuilding.

I have hardly said anything about how the tower was repaired, because if you can successfully renew or make good a portion of a wall measuring, say, two feet each way, and you slowly carry this process on, in time the whole will be new. Do not think that it is necessary to renew the whole; some is always good enough to strengthen and retain. At Sutton-on-Trent the whole of the original work outside was kept as the original builders left it, with the exception of the bulged face. The process of taking out old work and putting in new can only be properly learnt by seeing it done, and our present knowledge is the result of many years of effort and experience. You know that the Romans were very good builders, and that one of their methods of building was to have a band of tiles the full thickness of the wall alternating with a band of concrete. When repairing walls we bear this in mind. The bands of tiles or bricks bind and the concrete consolidates. Cost cannot be ignored, and it will be seen that a great saving can be effected if all the loose core which is taken out can be kept on the scaffold and put back as concrete, for hoisting is a serious item of expense.

It must be remembered that workmen cannot be expected to understand the value which we attach to ancient work. Neither should they be trusted to cut into an old wall for the purpose of repair without supervision. It is essential for the proper carrying out of such work that a man should be in constant supervision over the workmen and that he himself should have had previous training. Besides being a good antiquary, so far as our English and Saxon buildings are concerned, he must have a clear head for construction, and know all about building materials and their use. From this it will be obvious that the repair of buildings cannot be properly directed from a London office, and a specification for the repair of an ancient building is an absurdity.

Sutton Courtenay Church, in Berkshire, may be taken as an example of a beautiful building requiring repairs, such as will ordinarily be found to be needed. The tower is Norman work, and it, like Sutton-on-Trent, has had a fourteenth century belfry stage added. It had been plastered externally, but the weather had got behind the plaster so that it was only keeping the walls damp instead of protecting them. It was decided to point the walls and not replaster them.

In the matter of building, few things are more important than the treatment of wall surfaces, and any man undertaking the daily supervision of building work ought to take a trowel and learn how to point different kinds of walling. To begin with, the old mortar ought to be cut out of the joints for at least as far back as the joints are wide. Before pressing in the new mortar the joints ought to be thoroughly washed out, and if the work is to be of any use the mortar must really be pressed in, and not wiped on the surface in the usual way. Any one who takes an interest in building will have noticed the wonderful variety in the different kinds of modern pointing, and I think I may safely say that every one of these are bad. For example, what could be more foolish

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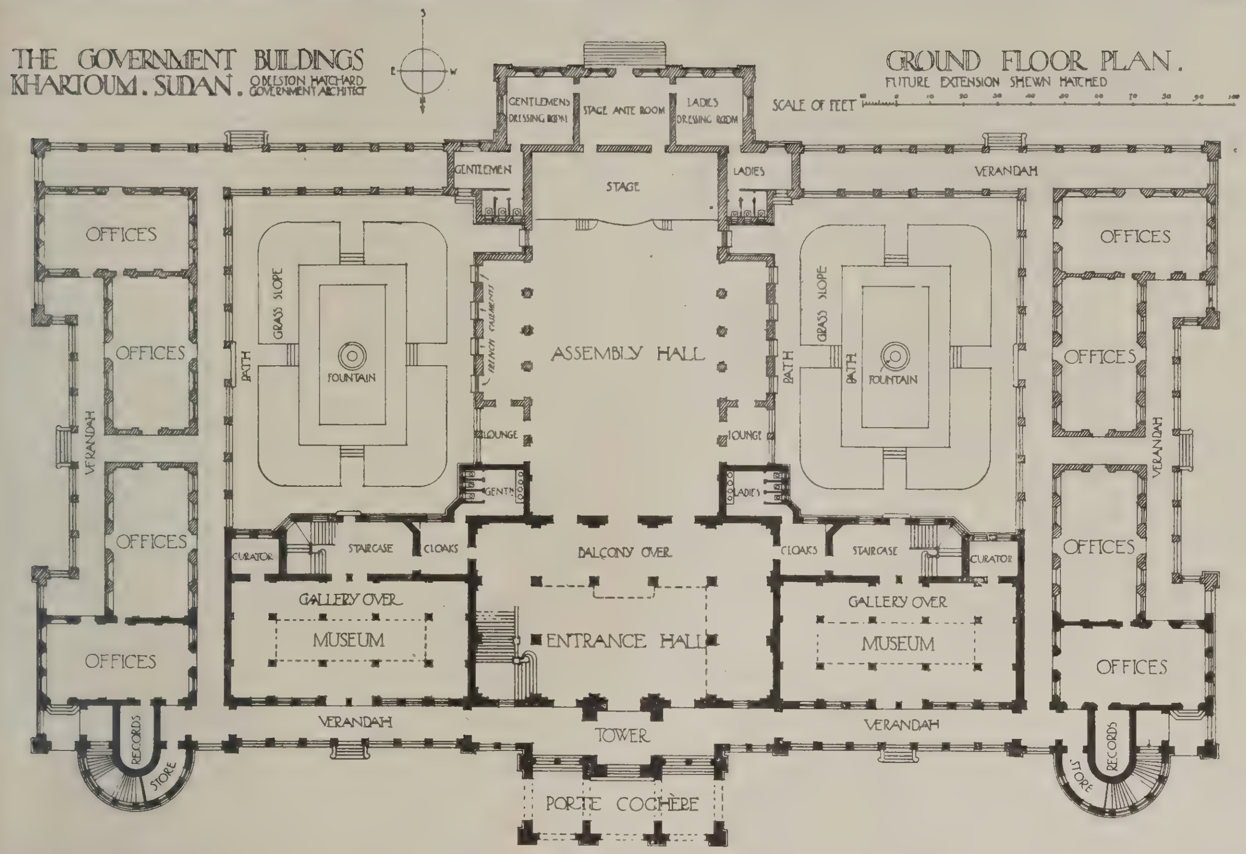
* A paper read at Carpenters' Hall on April 6 by Mr. Thackeray Turner, F.S.A., F.R.I.B.A.



than to put on a raised joint? The wet hangs on it, and the frost gets hold of it. It takes a long time to do, and like all unconstructural methods is very ugly when done. Could anything be much more silly than "tuck" pointing? and yet it is very difficult to do, and it may be taken as a good test of a modern bricklayer, as to how well he can do "tuck" pointing. The brick joints are raked out and filled with mortar flush with the walling, and then coloured over to match the brickwork. Then a line of white putty, or still worse it may be black putty about a quarter of an inch wide is run on all the joints, so as to make believe that the brickwork is very accurately built, with fine joints. Good pointing will always be flush with the wall face, and the best result is obtained when the joint is finished as the wall is built, but unfortunately this is not often possible, because a new wall stays wet for a long time, and if frost comes before it is dry, the mortar in the joints will crumble away, and then the joints must be pointed. The cost in this case is much greater, for there is no difficulty in raking out the joints when the mortar is fresh, whereas if you pay for the joint being finished as the work proceeds, and then have to pay for raking it out after the frost, and pointing it, especially if the scaffolding has been removed, obviously considerable expense will be incurred. The real difficulty comes in when a stone wall built of irregular stones with irregular surfaces has to be pointed. It seems to me that the old builders did the best thing. They threw the mortar on, and then scraped it off even with the projecting stones. I must not speak of mortars now, but I may just say that with bad mortar no good work can be done, and that you will never have bad mortar if you use four or five parts of washed river sand, and one part of blue lias lime. All good mortars are what is called "short," that is they are not sticky, and they fall off the trowel like wet sand when first mixed, but this can be rectified by mixing it beforehand and using it just as it begins to toughen. It is well known that blue lias lime is slow in setting, and therefore it should be kept moist by the use of a garden syringe for a couple of weeks after the work is completed, and if a cloth can be hung over the work so much the better, for it will keep the wet from drying out.

The chancel arch of Sutton Courtenay Church was badly twisted and cracked. It was found that the foundations had given way on the south side, which had caused a dislocation of the wall on each side of the arch. The first thing done was to secure the arch with a strong wood frame so that no movement could take place during the progress of the work. The loose earth was then removed to a depth of six feet below the wall, at which level a firm bottom was found. A new wall was built up under the old wall and wedged firmly under it; the crushed wall was then removed piecemeal, and replaced with new work. Over the chancel arch there is a fine coat of arms of King Charles painted direct on the wall. Of course this had to be preserved. As it was desirable to relieve the arch of the weight of the wall above it, a lintel or beam of brickwork was built into the wall from the chancel side. This was done by the same process of doing short lengths at a time and leaving toothing on the end of each length, so that the next length, when built, could be bonded on to it. This was successfully done without disturbing the plaster on which the Royal Arms is painted. As blue lias lime sets slowly, Portland cement was used for the new brickwork, as there would not be time to wait for the lime to set. On completion the brickwork was covered with smooth hand trowelled plaster, similar to the old and lime-whitened.

(*To be concluded.*)

## Correspondence

**Licentiates R.I.B.A.**

Sir,—May I venture to commend to the careful consideration of all architects (whether principals or assistants) who are not members of the R.I.B.A. the advisability of taking the present opportunity of becoming Licentiates of the central representative body? The title of Licentiate is conferred by Royal Charter; as a title it has its parallel in the L.R.C.P. of the medical profession, and the power for Licentiates to become Fellows, should they so desire, is secured by the Charter.

There are already several hundreds of applicants, and it is hoped that every *bona-fide* architect will be enrolled.

The next step will be the consideration by the general body of the Bill now being drafted to secure statutory recognition.—Your obedient servant, Edwin T. Hall.

54 Bedford Square, London, W.C.: April 10, 1910.

## ILLUSTRATIONS.

### LIVING ARCHITECTS.—NO. 32, MR. JOHN DOUGLAS.

Few architects have more notably upheld the position of provincial artists than John Douglas, of Chester, whose work, whether ecclesiastic or domestic, has been a source of delight to his *confrères* throughout Great Britain.

### NO. 33, MR. WILLIAM HENMAN, F.R.I.B.A.

Mr. William Henman ranks among the leading architects of Birmingham, and is especially known by his work at the Central Hospital and his advocacy of the Plenum system of ventilation.

### THE GOVERNMENT BUILDINGS AND ECONOMIC MUSEUMS, KHARTOUM.

THE Sûdan possesses practically no ancient architecture; true, a few remains exist of churches erected probably in the fourteenth century by Coptic Christians, but, unlike the neighbouring land of Egypt—the seat of the earliest civilisation—there are no wondrous temples or tombs such as bear witness for all time to the magic skill of the Egyptians of remote antiquity.

Thus, after the reconquest of the Sûdan, when it became necessary to erect buildings for administrative purposes, there was no indigenous architecture to reproduce or to work upon as the basis of a style for modern buildings suited to the exacting climatic conditions.

The Governor-General's palace, built on the site of Gordon's old residence, was the first important building of the new *régime*. It was commenced by Lord Kitchener almost immediately after the battle of Omdurman and is designed in the Florentine manner. Situated amid a wealth of tropical foliage, the effect of the white palace on the bank of the Blue Nile is certainly pleasing, though it is perhaps chiefly interesting for the rapidity of its construction and from the fact that it was built entirely by native soldiers quite untrained in the building crafts. The Gordon College, another of Lord Kitchener's achievements, is also Gothic in treatment. This building, as its name implies, was erected in memory of the heroic General who was killed in 1885 while defending Khartoum.

When the question of the new Government buildings was mooted the first consideration was as to style. After much thought a form of Saracenic architecture was adopted, this style being, of course, the product of the Mohammedan faith, and therefore eminently suitable for a country where the English have never sought to impose their religion or customs on the natives. Further, it has a certain likeness to the style of the buildings previously mentioned, and as it has ever been a style for Eastern lands it lends itself readily to a treatment designed to obviate the discomforts of a very trying climate.

The building is being erected on the peninsula formed by the junction of the White and Blue Niles. The part to be proceeded with at present contains the entrance hall (a room of noble proportions), the economic museums, and a masonic temple, the interior of the latter being modelled on one of the ancient temples of Egypt. The whole scheme, which it is hoped to carry out eventually, will comprise a large hall in the centre of the building adjoining the entrance hall, which will be used for official receptions, levées, &c.

The frontage of the building is 352 feet, the depth 230 feet, and the tower when completed will be 150 feet high.

The walls are of hard sandstone on a plinth of granite, and will be finished externally in white plaster, the ornate details being specially executed by skilled workers.

Internally a considerable amount of marble and mosaic will be used, and a feature is to be made of the great staircase in the entrance hall. The steelwork employed in the floors and domes will be supplied by Messrs. Francis Morton, Jun., & Co., of London.

The accompanying illustration is a reproduction of the water-colour perspective hung in the Royal Academy Exhibition of 1907.

The work is being carried out by the Sûdan Public Works Department, Captain M. Ralston Kennedy, R.E., D.S.O., Director of Public Works, the designs having been prepared by the Government architect, Mr. O. Beeston Hatchard.

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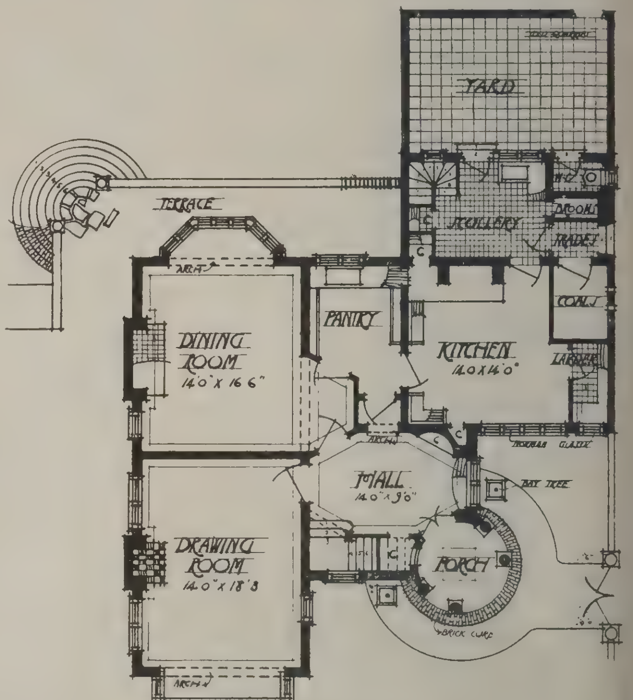
### THE WOOD HUT, FYLINGDALES.

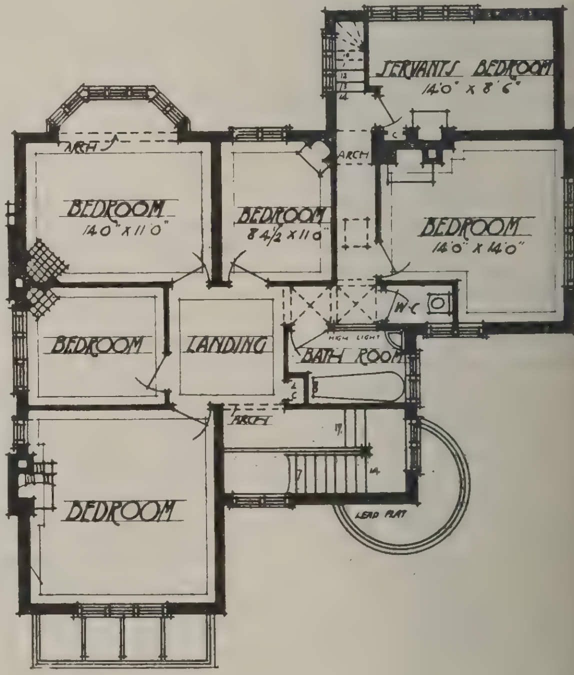
THIS house commands fine views of Robin Hood's Bay and Ravenscar. It is built externally of local common brick, covered with rough-cast. The plinth and caps to chimneys are of Staffordshire blue brick. The roof is covered with green Westmoreland slates. It is lighted by acetylene gas. The architect is Mr. H. Ascough Chapman, F.R.I.B.A., Leeds.

### HOUSE IN WALPOLE ROAD, SURBITON.

THIS house, which has lately been completed, occupies a corner site at the junction of four roads. The external wall of the servants' portion is brought out to the boundary to secure extra garden space, by doing away with the usual tradesmen's path. The walls are of Crowborough bricks, relieved by red brick and tile dressings to the windows and sills, and tile work in subdued panels introduced to relieve the brickwork. The window-frames have wooden projecting pins and are painted white; iron casements are used throughout where lights are made to open, the glass being divided up with broad leads in large divisions. The eaves, brackets, and iron casements are painted dull black, and the down pipes green. The hall is panelled and painted white, with an oak entrance door. The house is planned with a view to simplicity of arrangement. Mr. A. Jessop Hardwick, F.R.I.B.A., of Kingston-on-Thames, is the architect for this and several other houses on the estate. The contractors are Messrs. Limpus & Sons, of Norbiton. Messrs. George Wragge, Ltd., supplied the iron casements and fittings.



Ground Floor Plan



First Floor Plan.

## THE SOCIETY OF ARCHITECTS.

At the meeting of the Society of Architects held April 14 the following paper on "Constructional Steelwork," by Mr. S. Bylander, was read:—

The preparation of the plans for a building where the skeleton consists of steelwork as compared with a building where the loads are carried on walls or piers differs considerably.

I intend in this lecture to deal with the general principle of steel construction as far as it may interest the architect, and will not extensively go into the question of strictly theoretical methods for the calculations of the various members in a structure.

Steel is becoming a more and more important material in building construction. As the sizes of the buildings are increased and fireproof construction adopted, steel construction can be used with advantage. Heavy brick walls are substituted with steel stanchions, and rolled-steel beams are used instead of wooden joists, thereby saving rentable space, and by the use of fireproof floors the danger of ruinous fire materially reduced.

When steelwork constitutes the skeleton of the structure, it is obvious that the application of this material should be given careful attention. The architect must therefore make himself well acquainted with the principles of steel construction, or be in frequent consultation with an engineer competent in steelwork design. It is entirely wrong to prepare the final architectural design independent of the steel construction, and ask a contractor or engineer to design steelwork to suit the lay-out of the different floors.

Steel should be employed to its greatest advantage, and not merely as a substitute for brick and stone, as is often the case; for instance, where large rooms are required in the lower storeys while in the upper storeys are placed heavy division walls and brick stacks, and where positions of the columns vary in the different storeys. Economy is after all the essential thing to aim at, consistent, of course, with suitable planning and good architecture. The object of the design should be to obtain the best result for the minimum amount of money, and this can only be obtained when the different building materials are employed to their greatest advantages. It is obvious that the steelwork, brickwork and stonework must be designed simultaneously in order that no material should be wasted. The amended London Building Act of 1909 will give guidance to the architect and engineer, and insure uniformity in specifications and designs and undoubtedly prove of great advantage to the quality of construction generally.

Building regulations will not, in my opinion, retard the use of any satisfactory material provided restrictions are made for all materials and all treated on a fair basis, and I hope before long the necessary additions to the present Act will be made covering other classes of materials as well as steelwork. The advantages promised in the Act of 1909 will, however, not be complete until all buildings are treated on the same basis. At present there are no regulations for buildings constructed in accordance with the old Act, while stresses and loads are definitely specified for steel-framed buildings. The first consideration the designer has to take into account is the factor of safety and the loads which should be used in the calculations for the different members. One sometimes hears very strange opinions about the expression "factor of safety." If a specification requires that the steelwork shall be designed for a factor of safety of four, this does not necessarily mean that every member is four times as strong as that required to carry the specified load. Often a structure cannot carry more than twice the specified load on account of imperfect loading, material and workmanship, although it is designed for a factor of safety of four. The factor of safety is intended to cover unknown quantities which are not considered in the calculations. Good practice is to use a safe stress for steel equal to one-quarter of the ultimate strength of the material, or seven and a half tons per square inch if the ultimate strength of the material is thirty tons per square inch. As the elastic limit of medium steel is about fifteen tons per square inch, the actual factor of safety will be two. The construction of the steelwork must be adapted to suit the particular class of building for which it is required.

Buildings may be classified as follows:—Apartment houses, hotel, office buildings, public buildings, warehouses, factories. The general lay-out of steelwork for a building is primarily dependent upon the size of rooms and type of floor construction; secondly, upon loads to be carried and requirements as to decorations. The spacing of columns should be uniform if possible in order to permit repetition of sections and details.

The actual live load is not used in the calculations, but the corresponding dead load, which would cause the same stress in the steel as the actual live load.

This dead load is usually referred to as "superimposed load," and varies from 70 lb. to 120 lb. per square foot for apartment houses, hotels, and office buildings, and from 150 lb. to 400 lb. per square foot for warehouses and factories. To the above loads should be added the weight of the floor itself (including steel girders and beams), which is about 100 lb. per square foot for an average concrete floor. The dead load of floor must be carefully calculated in each particular case.

Steel may be used in a building for the following reasons:—(1) By necessity; (2) for economy; (3) for fireproofing.

Steel may have to be used in buildings where the design will not permit of the use of only brick and stone work on account of large rooms, great loads, architectural features, or planning requirements. It is used by reason of economy where steel is found to be cheaper than other material, or where the floor space saved by using steel columns instead of brick wall or piers will more than compensate for the extra cost of steel compared with the cost of brick. Steel beams and concrete is substituted for wooden joist floors and roofs in order to obtain a more fireproof construction, often to a considerable increase in the first cost of the building. However, the fireproof building may be more profitable to the owner than the old wooden construction when the reduced insurance premiums and the increased rigidity and stability are taken into consideration. No doubt fireproof construction will soon be adopted generally for large towns, and I will, therefore, in this paper only deal with that kind of construction.

In addition to the before-mentioned reasons for using steel in buildings there are others more or less important, according to conditions or circumstances:—

1. Rapidity of construction.
2. Possibility of changing the arrangement of rooms after the carcase of the building is completed.
3. Increased stability and rigidity; uniform distribution of loads on foundations to prevent unequal settlement.

Rapidity of construction is generally a question of economy. By speedy completion of the building, interest on the capital is saved. Possibility of changing the arrangement of rooms saves cutting away brick walls and putting in steel girders to suit the client's requirements. Such alterations of rooms may in many cases increase the rateable value of the building. A steel-framed building where steel is properly covered with protective material is, I believe, the most durable fireproof building that can be produced at reasonable cost.

Let us compare the setting out and construction of a brick building and a steel-frame building.

The setting out of a brick building need not be very accurate as to dimensions. The builders can set out the walls and foundations to the architect's plans and elevation drawn correct to scale, but not necessarily dimensioned. The accurate dimensions of the site are often not ascertained before the old building is taken down and the builder is ready to start work building the walls. A little variation between the dimensions sealed from the drawings and the actual dimensions of the site will not present any great difficulties or cause delay or additional cost. The dimensions can simply be agreed upon between the builder's foreman and the architect's representative on the site. It is neither necessary to have particulars of details when starting the work, as cutting away of little brickwork is not accompanied by any great difficulty should it be found at a later date that some alterations were necessary on account of some of the detail drawings not being ready when the work was commenced. In the case of a steel structure, however, it is most essential that the drawings are completely worked out beforehand and all details made. Ventilation, heating, drainage, lighting arrangements, &c., should be set out beforehand, and the general lay-out and steel plans made to suit the different requirements.

Economy is the essential thing to aim at, and generally speaking steel is being used in buildings because it admits of cheaper construction than other materials and at the same time ensures a reliable structure. By the use of steel the rental floor space is increased considerably; it also permits the use of large spans and less pillars, thereby enabling the future tenants to arrange the rooms according to their requirements. Buildings can be quickly erected and completed, thus saving interest on capital. In order to obtain true economy, however, it is necessary that the planning and designing, and also the method of carrying out the work, should be systematical and in accord with the general principles which I will deal with hereunder.

The steelwork plans should be ready several months before work can be started on site to allow for the time required for the manufacture of the steelwork at the mills; also it should be borne in mind that the steel can be obtained at a smaller cost if ample time is allowed for the steel contractor. It is advisable to order the full quantity of each section in one lot, and get the pieces cut to exact lengths at the mills. Considerable waste occurs if the shop has to draw material from stock. To take material from stock should only be permitted when very quick deliveries are absolutely essential. Generally speaking, complete dimensioned shop drawings should be made in the office in preference to setting out the rivets, connections and details by workmen in the shop. It is, of course, necessary for the engineer in charge of making the detail drawings that he must have a well-trained staff of draughtsmen who are thoroughly familiar with shop work, as the draughtsmen are called upon to do such work as the template worker would otherwise do according to the old practice. Positions of every rivet should be shown on the detail drawings, and nothing should be left to the judgment of the workmen in the shops. More reliance can be placed upon drawings which have been checked than upon setting out in the shop, which setting out is not usually checked.

Another advantage of having complete shop drawings is that every piece can be inspected and compared with the detail drawing, and errors in shop work can more easily be detected than if the work is set out in the shop without shop drawings. Every piece can be made complete to the detail drawing without fitting the different pieces together, and still they must fit perfectly when erected. The essential thing to remember in steel construction is that there should not be any alterations of the steelwork on the site.

It is a very serious proposition to make alterations to the steel design during progress of manufacture, and still more during erection. Not only will it incur delay and additional cost, but also less satisfactory work. Alteration work cannot as a rule be so well made as is possible if the original design was carried out. Records are difficult to keep, and inspection is unreliable. If all drawings are properly worked out and completed before work is started, the possibility of alterations is materially reduced. We will now follow the progress of manufacture of the steel from the date the steelwork drawings are ready and handed to the steel contractor.

The first thing the contractor has to do is to issue orders for rolling of the material. An inspector will be appointed by the architect or engineer to inspect the quality of material at the place of manufacture. The inspector will be at the mills when the material is rolled. He will be present when the chemical and physical tests are made, and make records of the results of the tests, and order additional tests to be made if the material does not run evenly. The inspector will reject and order such material to be removed which will not meet the requirements of the specification, and stamp and approve such which is satisfactory.

The approved rolled material is stamped with the inspector's mark of approval of quality of material. Any piece coming from the rolls is stamped with the blow or melt number, and this number is referred to on the test-sheet reports. The material in one and the same blow is usually the same, as great care should always be taken to have the melted metal well mixed before it is put into the ingots. Every piece is also marked with an identification number given on the detail drawings. This number is used for reference when consulting the drawings in the shop or when locating in which place the piece is to be erected on site. After being rolled and straightened the material is placed in the stockyard until required in the shop. As a rule the material cannot be rolled in the order it is required in the shop, but in such order as the rolls go in according to the rolling programme for the rolling mill. Weeks and often months may elapse before same section is rolled again. It is often, therefore, advisable to roll the beams for the roof at the same time as for the lower floors when same section is used. In the shop, however, the material is usually fabricated in the order as it is required on the site. The inspector is kept well informed as to the dates of rolling and manufacture, so that he can be present and inspect as required and as the work proceeds.

From the stockyard the material is brought to the working shop, and skilled workmen mark on the position of the holes, lines of cutting, &c., on the steel pieces direct with or without template. The number of the shop drawing and number of job is often painted on the piece before it leaves the working shop in order to assist the checker and inspector. Therefrom the marked material is brought to the drilling shop. In the case of built-up sections, as, for instance, a column composed of angles and plates, all the angles and plates are not marked and drilled separately, but only a few holes are first drilled; the different plates and angles are then bolted temporarily together and the whole thickness of metal is drilled through at the same time, thus saving time and assuring greater accuracy and all holes being true. Several drilling machines can be used for one member at the same time. Burrs are removed after the drilling, and the ready-drilled piece is sent to the assembly shop. Some pieces are milled or ground to fit; the different pieces forming one member are temporarily bolted together and sent to the rivetting shop. During assembly the detail drawings are consulted and dimensions checked. When the pieces are rivetted they are sent to the milling machines if any part has to be machined, such as ends of columns or bearing plates on girders. Before assembling some surfaces must be painted, as after assembly they are inacessible. Open holes which are to be filled with rivets in the field are marked by the assembler so that such holes shall not be filled in by rivets in the shop. Holes in small pieces and brackets are generally punched and rimered after assembling, but main members are drilled. Before the finished steelwork is painted it is examined by the inspector and all dimensions are checked. Ends of compression members which are machined must be examined, and it is ascertained if the ends are square to the axis of the member. If all measurements are correct and the workmanship is satisfactory, the inspector stamps the piece with his shop inspection mark.

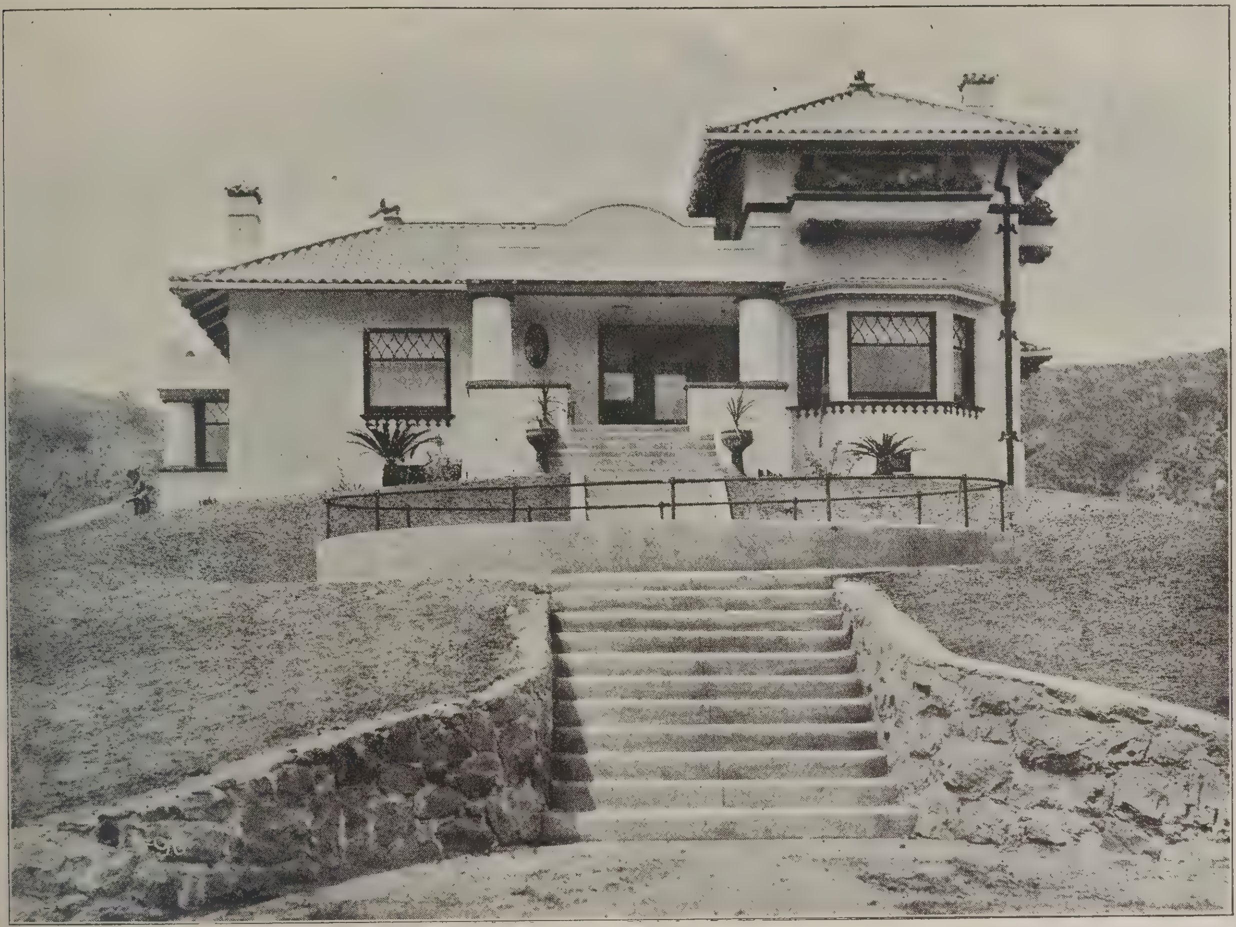
The material will now receive its shop coat of paint or oil before shipment.

Any piece or bundle of pieces must not be shipped unless having the following marks applied:—(1) Blow or melt number; (2) identification number; (3) mark of mill inspection; (4) mark of shop inspection; (5) shipping mark.

When painting the material before shipment all marks made in the shop are extinguished (except those above stated). A small circle or triangle with white paint is made around the marks previously indented by stamps. The shipping mark and the identification mark is applied by paint in large and distinct letters or figures. Sometimes pieces for different parts of the building are painted in different colours, or a spot or ring of a distinguishing colour is applied to facilitate selection of the material at erection. If the above described methods are used little or no difficulties will arise at erection, and no risk is taken of material arriving at the site incorrect. The inspector makes remarks on his copy of the shop drawing when approving any piece at the time when his stamp of approval is applied. He has also to see that the material is shipped in the right order as required on the site. After completing inspection for each lot he makes up a proper list of material. The works do likewise, and the two lists are compared and checked. Several days before a shipment is made the shipping statement is written out in detail, and instructions are issued for shipment or transport of the material to the site. As the material passes out of the works it is weighed, and the inspector records the weight and counts the pieces weighed and sees if they are in agreement with the advice of shipment. The weighing machine should be checked at regular intervals by an independent party to assure that it registers the correct weight. The shipping statement, advice and invoice is now sent to the contractor as the material is shipped if the contractor only buys the material but executes his own erection.

According to requirements the steel is transported on van, railway car or barge, or by ship. Considerable damage to the material may occur during transport if proper precautions are not taken against careless handling when loading or unloading, so that small pieces are not bent or crushed by large or heavy pieces placed on top. Delay, mixing up of the different consignments, is a source of great inconvenience and prevents speedy and methodical erection.

The material is usually brought alongside the building on vans, and is hoisted by the erection cranes to a place on the building near to where it is to be erected, or sometimes directly placed in its final place. The different pieces are first temporarily bolted together and afterwards set to correct level and made plumb, after which all holes are filled with rivets. The steelwork is painted immediately after erection, and if more than one field coat is applied different colours of paint should be used. Floors and walls are built and fireproofing applied. The erection of the steelwork should be two storeys ahead of the floors. The floors should be put in one storey ahead of the walls as may be convenient. In cases where walls partly support the floors or girders the



HOUSE NO 1.

walls must, of course, be built the same time as the steel is erected. In order to prevent accidents to workmen below, the floors should be put in close to the steel erection, or the floor framing should be boarded over to prevent any tools or material falling on the men below. At the same time the different trades should be kept separate so as not to interfere with the rapid progress of the work. When the carcase is complete and the roof is on, heating, ventilation, &c., are installed, partitions built and joinery and finishing completed. In the carrying out of a large job it is not always satisfactory to put the responsibility on to different parties for designing, detailing, manufacture, inspection and erection, as no one particular system is followed.

In my opinion one man should be responsible for the systematic carrying out of the work.

The engineer responsible should bear in mind that no work is satisfactory unless the following requirements are fulfilled:—(1) Economic and safe design; (2) good material and workmanship; (3) correct work as to dimensions; (4) prompt deliveries; (5) proper erection.

Satisfactory design can only be obtained by making a special study of the conditions and prepare accurate drawings and calculations. Good material can be assured by tests and inspection. Correct work can be obtained by systematic working and supervision. Prompt delivery is dependent on each portion of the work being ready in schedule time. Careful watching of each department is necessary, particularly at the early stages of the work. It is wrong to suppose that after a good design and specification are made the responsible engineer's work is done. A good specification is of equal little use without inspection as a clever design without proper shop drawings. The practice of taking a few test pieces from a job and sending them to a testing firm is not reliable, and is more deceiving than convincing. It may be that the test piece selected will show good results, while material in other parts of the structure is bad. The material should be tested at the mills during the progress of manufacture.

As I have previously said, satisfactory results can be obtained by the use of steel for buildings if the architect and engineer work hand in hand and the work is carried out systematically in all details.

When preparing plans and calculations for a building the work should proceed in the following order:—

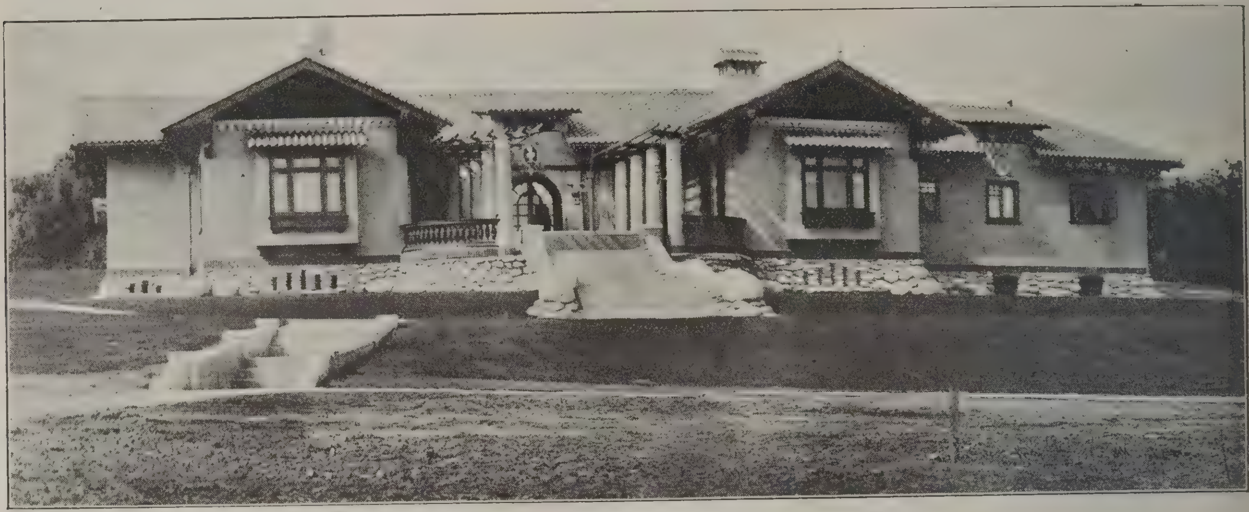
1. The specification drawn up for stresses and loads.
2. The principal members for the structure to be calculated, and it should be ascertained whether the setting out of the columns and girders is economical and reasonable, and, if necessary, such modifications made as will improve the construction.
3. When the architectural plans are completed the engineer will calculate all the loads of floors, walls, &c., make stress sheets for each member, after which a set of plans is made and the required sizes given. The sizes of the steelwork thus obtained are drawn to scale on the architectural plans, and, where necessary, the engineer will modify the sections to suit architectural requirements; after which the architectural plans are practically completed, the shop drawings made, and the contract placed with the steelwork contractor.

## REINFORCED CONCRETE FOR HOMES.

By A CALIFORNIAN.

HAVING long passed the experimental stage, the employment of reinforced concrete as the important building material of the near future is assured, and it will supersede all others not only for substantiality and durability, but also from a sanitary point of view; and the fact that it has proved its worth on many occasions as an admirable fire-resistant gives it a claim to the fullest consideration, and places it in a class that is entirely its own. Architects and builders have not been slow to recognise its merits, and that it permits of more rapid construction than almost any other material.

Concrete construction is undoubtedly to be the substitute in house construction when the scarcity of lumber (so much heard of) demands an adequate building material to replace that commodity, and thus an improvement will come into vogue that will be of permanent value, inasmuch as the cost of the building is very little more, and the additional investment will total out less than the insurance premium on the lumber building, the work is made permanent, and insurance can very well be eliminated, the inflammable material being reduced to a minimum and the risk easily handled. When these facts are grasped and recognised by the home builder concrete construction will have the pre-

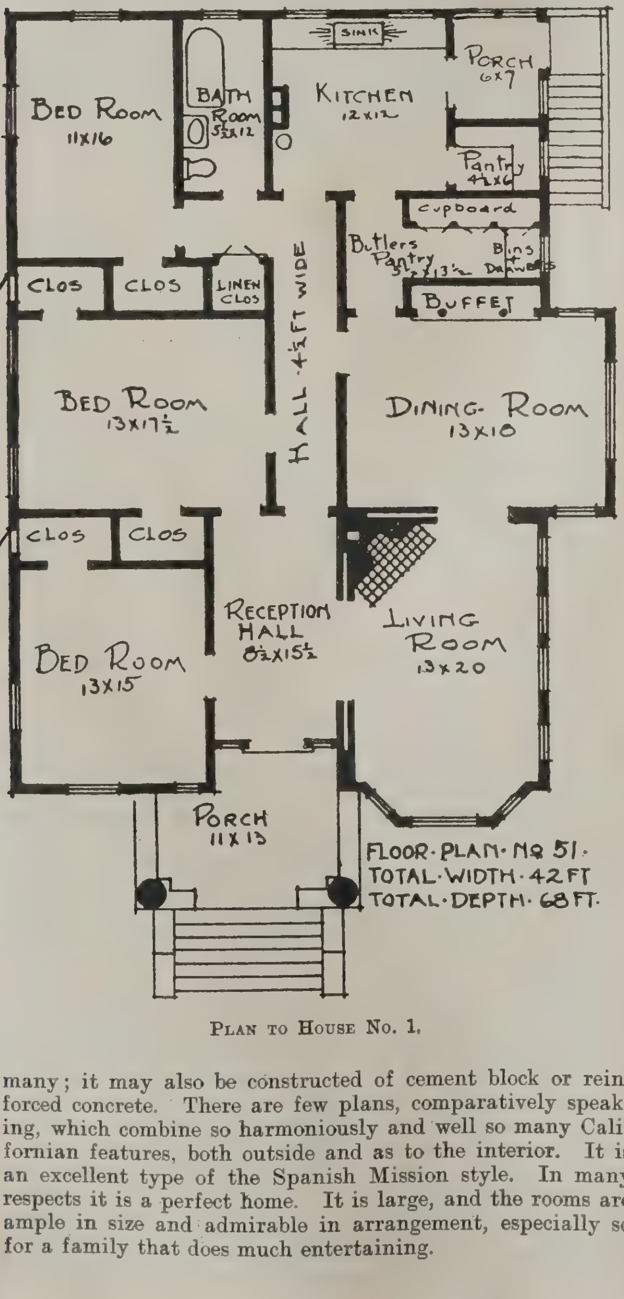


HOUSE NO. 2.

ference, as the material will readily lend itself to the artistic conception, as well as being durable.

The illustrations herewith will furnish some idea of the artistic capabilities of the material, and the floor plans some good ideas to work on.

No. 1.—This cement-finished bungalow of seven rooms, exclusive of tower and bath, is a home that will appeal to many; it may also be constructed of cement block or reinforced concrete. There are few plans, comparatively speaking, which combine so harmoniously and well so many Californian features, both outside and as to the interior. It is an excellent type of the Spanish Mission style. In many respects it is a perfect home. It is large, and the rooms are ample in size and admirable in arrangement, especially so for a family that does much entertaining.

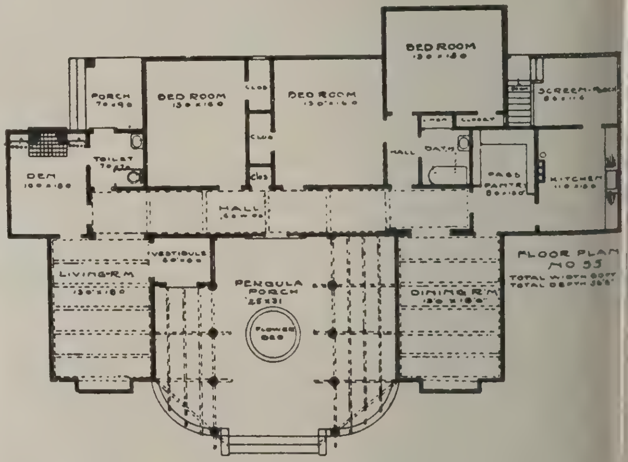


Plan to House No. 1.

The reception hall, living room and dining room are arranged *en suite*, with a floor space of nearly 700 square feet. To this a corner bedroom may be added by throwing open the connecting door. The roof may be red tile, or if it is desired to lessen the cost use metal tile, which is 50 per cent. cheaper. The flower-boxes are of cement. Hardwood floors and beam ceilings are used in the principal ground-floor rooms.

The sun room at the left, opening off the dining room, with its comfortable seats, will be appreciated by many. The tower room can be used as an open-air sleeping room, or it may be fitted with windows and used as a sleeping room or den. And here is another pleasing innovation. The rear part of the roof can easily be made into an attractive roof garden. The dimensions of this house are 43½ feet front and 44½ feet deep, exclusive of porch, nook, &c. As indicated by the illustration, this house should have a site that will set it off to advantage and lend itself to scenic effect.

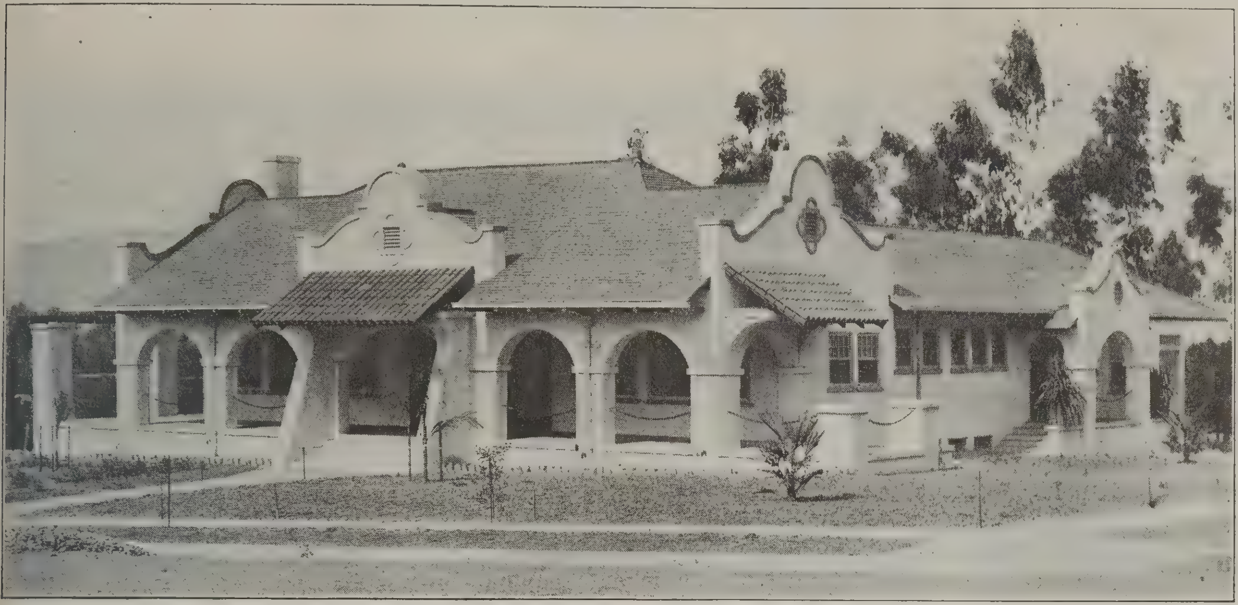
No. 2.—This design should be surrounded by spacious and well-planned grounds in order to fully develop its artistic merit, and if to this might be added the advantage of an elevated location the condition would be perfect. We have seen it, however, on a level city lot, surrounded by well-kept lawns and semi-tropical plants, and have been ready t believe it the most beautiful place in the world.



Plan to House No. 2.

The entrance is quite unique, being into an open pergol court, at the end of which is the main entrance. Directl in front is the charming feature of the house, a circula flower-bed, and a many-paned window opens into a com modious hall. The dining room and living room occupy th front entirely, and all rooms have an outside view. In th way every room in the house has almost immediate access t the outside.

The mantel is in the reception room, and is faced wit brick in two shades of brown. The living room has panelled wainscot and beamed ceiling, while the dining roo has only a deep cornice beam. Large closet space is provide and an excellent bathroom.



HOUSE NO 3.

No. 3.—This is a concrete bungalow that is well adapted o a cold climate as well as a very warm one, as the walls are well protected, affording shade and keeping the rooms dry. This house may be built on a corner lot, or would show well with plenty of space, and the floor plan can be easily arranged.

## FIRE ALARMS.

By T. E. Lander.

THE subject of my paper is the scientific detection of fire with special reference to the Leslie Walker system of automatic alarms. As a director of the Leslie Walker Company, I wish to point out the perfection of this system, but I can only hope to do so by clearly explaining the principles on which it is based. It is also my earnest wish to make no claim for our system that the company cannot substantiate. While we are naturally doing all we can to make our company a financial success, my interest in the subject of automatic fire detection goes a long way beyond my concern about getting a good return for my investment. I want to see reliable automatic fire alarms far more generally understood and used than at present, because I know what a great number of lives they will annually be the means of saving. They will also save an immense amount of property, but that, of course, is of secondary importance. If I ever come across a system that I believe to be a better one than our own, I for one will ungrudgingly wish it success.

There are three essential features of a perfect fire alarm, namely :—

1. Great sensitiveness, so that very early warning is given on the outbreak of a fire.

2. Freedom from liability to give false alarms ; and

3. Freedom from danger of being tampered with, and put out of action, either by merely inquisitive persons or by ncendiaries.

While I consider the above absolutely essential, I would add, as a fourth very desirable feature, that the system hould be such as to permit of easy and rapid testing of all ssential parts that could by any possibility be put out of order without an automatic warning being given.

As in the case of all the systems of which I have any knowledge, our alarm consists of a detector, or instrument ensitive to fluctuations of temperature, which on an outbreak of fire completes an electric circuit, and this, in turn, ings a gong or gives other warning of the outbreak. The de- ectors of the various systems are, like the brain in the human eing, what make the greatest difference between success and ailure. In fact, a good detector may very aptly be described s the brain of its particular system. I would liken our own etector to the brain of a man who stands with a thermometer in one hand and a watch in the other, and who ever for one moment thinks of anything but the relative movements of the mercury in the thermometer and the second hand of the watch, knowing that, if a fire takes place anywhere near him, the mercury will expand at a greater rate than it ever does under normal conditions.

It would not be sufficient for such a man to study the thermometer without the watch, and the production of an instrument which would properly combine the two observations was what had puzzled all inventors of automatic fire alarms until Mr. Leslie Walker produced his. It will at once be evident to you that the mere observation of degree of temperature would not be enough if you think what would happen on the contents of a waste-paper basket catching fire in the study of a private house and also a similar one in a large public hall, such, for instance, as the Library of Glasgow University. The cubic feet of air in the main hall of the University Library will, I think, be somewhere about 500,000, whereas it is a good large private room which contains one-hundredth of this quantity of air, or 5,000 cubic feet. While each waste-paper basket is burning the heat generated will be very much the same, so it is quite apparent that if anything approaching the same speedy warning is wished for in two such cases, it will be necessary to use instruments of entirely different degrees of sensitiveness. To be of any real use, an automatic alarm must be such as can be depended on to give warning in the very earliest stages of a fire ; the sensitiveness of the instrument must be such as to suit the particular room in which it is installed, and, as I will endeavour to prove to you later on, the necessary degrees of sensitiveness vary to a far greater extent than would at first be imagined and cannot be estimated by guess-work. I think it is now admitted by every disinterested person who has studied the subject, that fixed temperature alarms are of no practical use, and that no system can be reliable unless it compensates for, or takes no apparent notice of, ordinary fluctuations of temperature, but which gives almost instant warning when an abnormally fast rise of temperature takes place. Even such an instrument as this must give warning if a dangerously high degree of temperature is reached slowly, as in the case of a smouldering fire which has not yet broken into flame. The Leslie Walker instrument fulfils both these conditions.

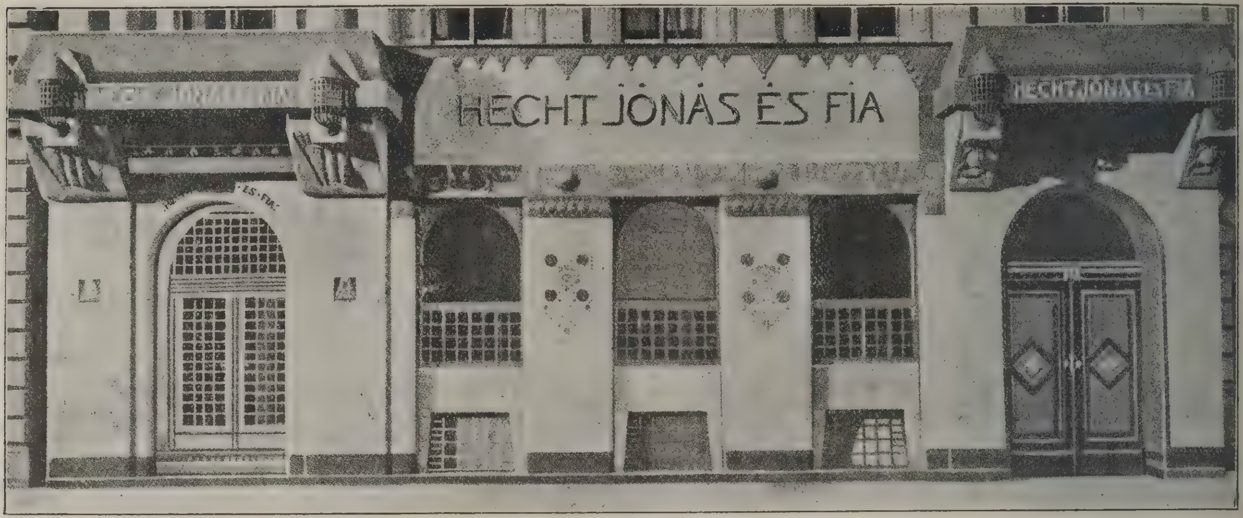
The earliest automatic alarm of which I have learned had for its detector an ordinary mercury thermometer with two wires passed through and fused into the glass, the end of one permanently in the mercury, and the end of the other at some part of the tube which the mercury would never reach under normal conditions, but which it would reach after an outbreak of fire, and this, of course, was a purely fixed temperature alarm. The wires were connected with an electric battery and a gong in such a way that the gong would be sounded the moment the mercury completed the electric circuit by coming in contact with the upper wire. The battery, wires and gong are still used in most fire alarm systems, the detector being the part that had to be greatly changed.

I purposely use the word detector throughout my paper instead of thermostat, which is generally employed, because I consider the latter only suitable for use in the case of a fixed temperature alarm.

While the fixed temperature alarm which I have just described might have proved to a certain extent serviceable in buildings which contained small rooms all of one size, in each of which the artificial heating was the same, and each

## MODERN EUROPEAN ARCHITECTURE.

### HUNGARY.



[From *A Haz.*

SHOP FRONT IN BUDA-PEST. M. Bela Lajta, Architect.

of which was equally exposed to the sun, it would be of practically no use elsewhere, and there are hardly any such buildings as that described.

I have not been able to discover any disinterested literature on the subject, and I am unable to say what was the first step in advance of the purely fixed temperature alarm, of which there have been several, but quite a number of very ingenious contrivances have been invented with the object of overcoming the objection to it, and of providing an instrument which would compensate for ordinary fluctuations of temperature, and only give warning when the rise of temperature takes place at too great a rate. While some of them compensate to a certain extent, up to the present Mr. Leslie Walker's detector is, so far as I have been able to learn, the only one which perfectly fulfils this requirement. As some of these inventions are still in use and capable of providing more or less efficient protection if their limitations are recognised, and they are only used in situations for which they are suited, I cannot compare the systems by name, or as fully as a disinterested person would be justified in doing, nor have I any wish to disparage them. I feel that there is plenty of room for us all, and that the more fires of which there is timely warning given by any of the various systems, the more will the insurance companies and the general public realise their value, study their relative merits and protect their lives and property by installing one or other of them. My desire is that this recognition of their value, and anxiety to make use of the best system, should spread rapidly; I am not afraid of the result so far as our own company is concerned, if we can only get the principles of the system intelligently considered by persons who are really desirous of securing such great protection as it provides.

This brings me to the point at which I must explain the principles of our system and prove to you that I have claimed nothing for it but what we are able to substantiate.

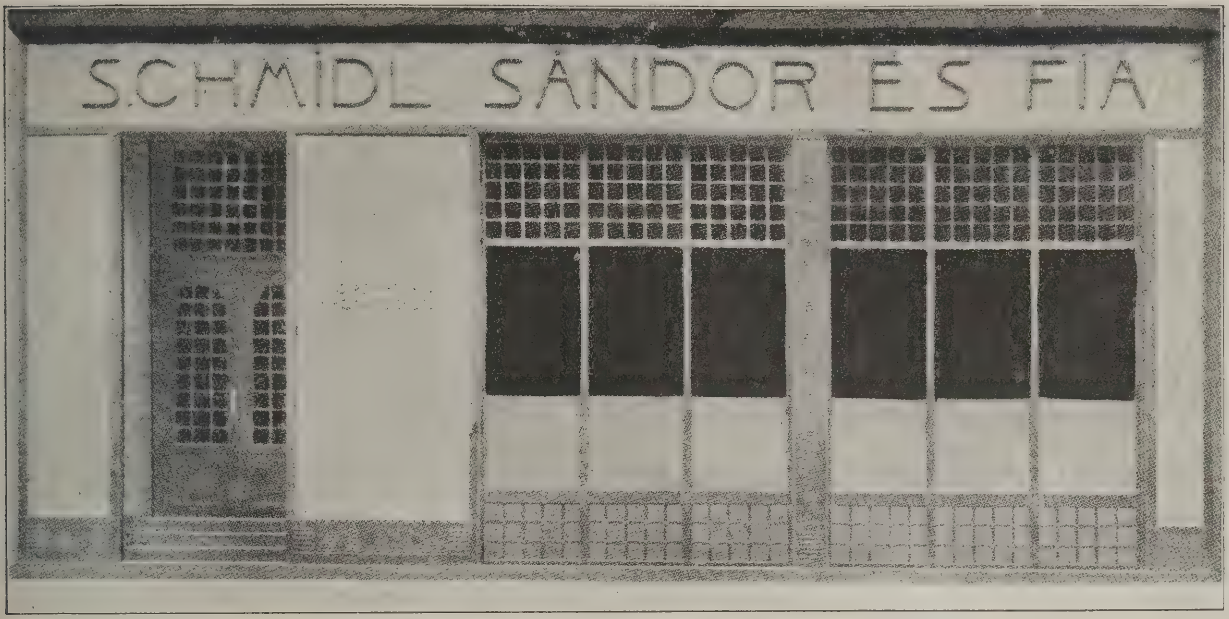
I mentioned, as the first qualification of a good fire alarm, great sensitiveness, so that early warning is given on the outbreak of fire. This, as I have stated, can only be perfectly brought about by a detector which absolutely compensates for all ordinary fluctuations of temperature. In our system the warning is just as rapidly given if a fire breaks out when the temperature of the air is below zero as it would on a hot summer day. In the detector which does not fully compensate for all normal fluctuations, on a cold day there will be a greater gap between the points that have to be connected to complete the electric circuit than there will be on a hot day, and, therefore, a longer period between the outbreak of a fire and the sounding of the warning gong. When one considers how easily a single person can usually extinguish a fire if it is caught in its early stages, and what difficulty there is in putting it out when it has got a good hold, the importance of early warning is very apparent. On a hot day the gap in a non-compensating detector will be less than on a cold day and the danger of false alarm increased.

To work without trouble with this great degree of sensitiveness, the detector must be such that it will not be affected by any vibration to which it is likely to be subjected. It is very evident that in a detector which is liable to be affected by vibration, the contact points must be set a certain distance apart irrespective of the size of the room and of the normal fluctuations of temperature. I will endeavour to explain how serious a defect this is, as it is not quite apparent at first sight. Take, for example, an instrument which cannot be depended on to give no false alarm unless set in such a way that it will not give warning of fire until the temperature rises at the rate of 25° Fahr. per minute or more. This may be all right in a small room, but what would be the result in a hall such as that which I have already referred to, the Library of the Glasgow University? In this hall, which is protected by our system, as are the Museum, the rest of the Library, and certain other parts of the University, the instruments which we have installed at some of the highest points, about sixty feet from the floor, will give warning of fire if the temperature rises more quickly than $\frac{1}{4}$° Fahr. per minute. Before deciding to use instruments of this degree of sensitiveness we made tests in a way that I will describe, and found that, with the doors and windows closed, the heating apparatus in the room could never raise the temperature of the air at a greater rate than 1-40° Fahr. per minute. This does not mean that the heating apparatus is not powerful enough to heat the room properly, but merely that, owing to the enormous volume o air to be warmed, the process is necessarily slow. In such room it would be useless to instal detectors which would no act at a lower rate of rise than 25° Fahr. per minute. I believe such detectors would, under the conditions described only act as fixed temperature alarms, and only give warnin after the fire had either become a very fierce one, or had bee burning for a considerable time. At a demonstratio which we gave after the University installation was completed, we lighted two copies of the *Glasgow Herald* unde the highest portion of this room and the warning gon sounded in less than half a minute. I firmly believe tha there is no other existing detector which would give anythin approaching this result when set for ordinary working conditions, and not adjusted immediately before the demonstration. In spite of their extreme sensitiveness, these instruments, which have now been installed fully a year, hav never given a false alarm.

Realising the importance of it, Mr. Walker has ver carefully studied how to ensure that detectors of proper degrees of sensitiveness are used in each situation. He wante each detector to be as sensitive as possible, to ensure speed warning in case of an outbreak of fire, but at the sam time it had also to compensate for all the normal fluctuatio of temperature to which it was likely to be subjected. T take two extreme examples, a detector for use in the dryi room of a laundry would require to compensate much mo rapidly than one to be used in a building which is nev heated artificially. Mr. Walker found that the fluctuatio of temperature varied so greatly in rooms of different size and used for different purposes, and it was so impossible arrive at a correct estimate of the rapidity of the fluctu tions by guess-work, that he invented an instrument for th

## MODERN EUROPEAN ARCHITECTURE.

### HUNGARY.



[From *A Haz.*

SHOP FRONT IN BUDA-PEST. M. Bela Lajta, Architect.

special purpose. If we are in any doubt as to the fluctuations of temperature in a particular room, we leave one of these instruments in it for two days, or longer if we think it necessary. At the end of this time the instrument shows, not the maximum temperature reached, but the maximum rate at which the temperature rose at any one time, which, of course, is what we are concerned to know. Mr. Walker calls this instrument a ratiometer. Where there is any doubt as to the maximum normal temperature it is ascertained by means of the ordinary "maximum thermometer."

Having satisfied ourselves as to the maximum rate of rise of temperature in any particular room under normal conditions, we are in a position to say how sensitive an instrument we may instal without fear of its giving false alarm, and the great importance of this does not, I think, require any further demonstration than I have already given. But this knowledge would be of little use if our detectors could not be made to exactly suit the requirements of each situation. Fortunately, after an immense amount of experimenting we are able to make them of any degree of sensitiveness from 1·5° Fahr. per minute up to, if necessary, 50° Fahr. or higher.

The degree of sensitiveness has to be arranged for while the instrument is being made, and this is a most important point, as it ensures that the sensitiveness of the detector can never be altered after it is once installed; to do this one would require to replace the detector by an entirely new one. Before any detector is put into use, its degree of sensitiveness, as represented by the rate of compensation, is marked on it after being ascertained by means of another instrument which was invented by Mr. Walker, and which he calls an incrementometer. I am particularly anxious you should bear in mind that, when once installed, no one can alter the sensitiveness of our instruments, as this is a very great element of safety.

(*To be concluded.*)

## ST. GILES'S CHURCH, SHELDON, WARWS.

ST. GILES'S CHURCH is situated in the little rural village of Sheldon, in the county of Warwickshire. The greater portion of the church is of the Decorated period, but the tower s of later date, and the old timber roof in the nave still emains.

The church, an edifice of red sandstone, was built in 291 A.D., and was founded by Roger de Northburgh, then Bishop of the Diocese of Coventry, and the Canons of Kenilworth, and it is very probable was built by the monks and aymen of Maxstoke Abbey, which is close in the vicinity. The plan of the church consists of a nave 67 feet by 20 feet 6 inches wide, at the west end of which is a tower 16 feet square. At the east end is the chancel 29 feet by 17 feet 6 inches wide, with a low side window and Early English piscina. On the north side of the nave there stands another chapel of fourteenth century date, 44 feet 6 inches long and 13 feet wide, on the site of an earlier one which was the "chantrie chapel dedicated to our Ladie," and built by John de Peto in the twelfth century. Inserted in the internal wall of the tower is a stone slab bearing the following inscription:—

"In Dei noie . . . lord MCCCCLXI ys stepel was begon ye masson had tho and forti pond iiijs and viijd for makying of the sepel."

The window illustrated last week is one of several good examples of the Decorated period in the church, and is a fine specimen of geometrical tracery. The panels are however of later date, probably the carving being added when the church was being restored in 1867.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has a not very interesting number this week, the illustrations being of the Union Boat Club House, Boston, Mass.; the Wholesale Fish Market, New York; two wooden houses at Montclair, N.J., by Mr. Frank E. Wallis, and some students' work from the Society of Beaux-Arts Architects.

*La Construction Moderne* (Paris). The Farnese Palace at Rome, having just now a specially topical interest in France, our contemporary gives some detail illustrations of parts of this notable building from photographs recently and specially taken.

*Arquitectura y Construccion* (Barcelona) devotes special attention to the work of the lately deceased architect, D. Juan Torres y Guardiola, with illustrations of some of his more strictly engineering work. The principal other example of modern Spanish architecture illustrated is the new Spanish Theatre at Barcelona, of which D. Melchor Vinals Munoz is the architect.

*Construction* (Toronto) has some good photographic illustrations of the Ca d'Oro and Contarini-Fasan Palaces at Venice, and an interesting article on Architectural Education in Toronto. A full account and many illustrations and diagrams are given of the construction of the movable dam at St. Andrew's Rapids, Manitoba. The New Theatre at New York, by Messrs. Carrere & Hastings, is fully illustrated and described.

The *Architectural Record* (New York) deals with some examples of utilitarian or business architecture in Chicago, with the work of Rudolph Zahn, a German architect, and with other examples of modern work in Germany.

*Engineering Record* (New York) has an account of the foundations and steel-frame structure of the Bryant Building, New York, an erection of thirty storeys, rising to a height of 338 feet above the street.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### Modern Indo-European Architecture.

Sir,—I should like to make a few remarks respecting Mr. Havell's criticism of Modern Indo-European architecture in your issue of February 25 (Supplement, p. 14), and the adoption of his so-called Hindu architecture, which he so strongly advocates.

As an architect practising in Madras since 1883, this subject has from my advent here engaged my earnest attention, and it seems to me that in the earnest desire to advance Indian art, the advocates of this school have entirely lost sight of a few points which require deep and wide consideration. These are as follows:—

1. Is archæology to be entirely ignored and rendered a dead science or art?

2. Are we to ignore our nationality as the ruling race, and to leave no trace whatever of our sojourn here?

3. Is architecture a history or not, in brick or stone, of a nation?

4. Is not the so-called Indo-Saracenic or Moghul architecture as foreign in this Dravidian country as the much despised Classic or Gothic of the West?

5. If we are to adopt Indian architecture for the sole advancement of Indian art, what architecture are we to adopt in this Presidency, wherein Moghul art is as foreign to the natives as the much despised European styles?

I will take the above questions in order.

1. Archæology, I think, demands our regard, coupled as it has always been with architecture from the earliest ages in all countries of the world. I will first ask, Is it in accordance with the first principles of art and architecture to commemorate the reign of our late illustrious Queen-Empress Victoria by erecting buildings to her memory in a style which is false to archæology and false to future history?

Can you truthfully commemorate and hand down to future archæologists a building built as a memorial of the Victorian rule in India, when it falsely represents the Akbarian age of Moghul rule. Is this truth? No. Is it archæology? No. Then I say it is not architecture. It is imitation, falsity, deception, and against the first principles of true art.

Either we must go on building these falsehoods, and rendering archæology a dead letter, or at once be truthful to ourselves, and like the Romans and Grecians of old, adopt our national styles, and continue to let archæology live, and architecture be as it always has been, a history of a nation in brick or stone.

2. Are we to ignore our nationality as the ruling race, and to leave no trace of our sojourn here? To answer this I refer all to history. Did the Romans leave no trace of their sojourn in the countries they governed? Are there not decided Grecian traces in Northern India? Did Alexander try to hide his face or change his vesture, so as to practise a studied deception on the long-after coming Anglo-Saxons? Certainly not.

3. Is architecture, or is it not, a history in brick or stone of a nation, and has it not always been so? If it is not a history of a nation in brick or stone, then assuredly it is never architecture, but merely decorative engineering or building.

4. The so-called Modern Indo-Saracenic or Moghul architecture of the Madras Government buildings is far more foreign to the Dravidian than the despised Classic or Gothic. It is foreign, the foreign architecture of the Mahommedan conquerors, and anything but indigenous to the Madras Presidency.

5. This is answered by the adoption of Dravidian architecture. Let us then at least be truthful, and erect and crown our Government buildings with many-storeyed Gopurams, covered all over with repetitions of miniature pediments of Classic character as in Hindu architecture, and depicting not Hindu mythology, but the chief events in the Victorian age. What a noble and inspiring architecture we might attain to, something more novel and extraordinary than beautiful.

I have no leaning towards any particular style; architecture, if good, is architecture, no matter what be the style. If a suitable and adaptable style is sought after for this country of bright sunshine, deluges of rain, and flat roofed cooling areas, after a residency of twenty-seven years I would advocate an oriental treatment of Perpendicular Gothic. This may astonish many, but it would be national and true to the ruling race, and leave some trace behind of an English rule, for at present we leave naught behind, lest it be empty and broken soda water bottles and kerosine oil tins. Its almost flat roofing, its four-centred expanding-span arches, its fan vaulting (so easily executed here), its deep buttresses affording shade and support to balconied verandahs, its small deep recessed windows, make it, if orientally treated, the most elastic style suitable to a tropical climate. It could not deceive the future archæologist, if orientalised, any more than does the present House of Parliament buildings. Its nationality is unique. It lends its plan to any form, and with its buttresses pierced for verandahs it does away with that terrible "bird-cage" appearance which the present Government buildings all possess. Any amount of ornament can be lavished on it, it lends itself to breadth and repose, and above all to a picturesque skyline and artistic massing. The great fault in the modern Indo-Saracenic is its structural untruthfulness and its excessive small detail and profuseness of useless ornamentation. The modern Indo-Saracenic buildings of Madras are only characteristic externally, but internally they are a mixture of modern Minton tile work and copied Moghul art, jumbled up of parts of East and West, and "never the twain shall meet." We have our duty to archæology to attend to as well as to architecture, and we must not sacrifice the architecture of our buildings to the advancement of native art. Let us at least be truthful, and not ashamed of our nationality, even in modest architecture which is to be a legacy to our descendants. Otherwise, abolish archæology entirely, abandon architecture and history, and let us go in for decorative engineering and plain building. To adapt any style to the requirements of any particular climate only requires architectural brains and a little talent, combined with a long residence in the country to understand the wants of the climate.

Sad to say, not a dozen natives in the whole of this Presidency care a fig about architecture, neither are they taught the first principles of the art, and care less about it, and until the Government teach architecture, the mother of all art, in the colleges, little or no improvement can be made in advancing indigenous art. We don't want artistic vases, paintings, mural decorations and oriental carpets and metal craftsmanship to adorn buildings that are but four plain walls with holes in them for doors and windows. The history and prosperity of a nation lies in its buildings; they are the language which speaks of its greatness, and they are the foundations of all art, for without them art is not required.

W. N. Pogson, F.R.I.B.A.

Madras: March 23, 1910.

### The Remuneration of Architects.

Sir,—Your leading article in the current issue of *The Architect* makes very interesting reading, and once again brings into prominence a matter of some concern.

But in regard to payment of members of our profession, though the percentage system has its defects, yet I do not see how it can be satisfactorily amended by substituting a scale of fees.

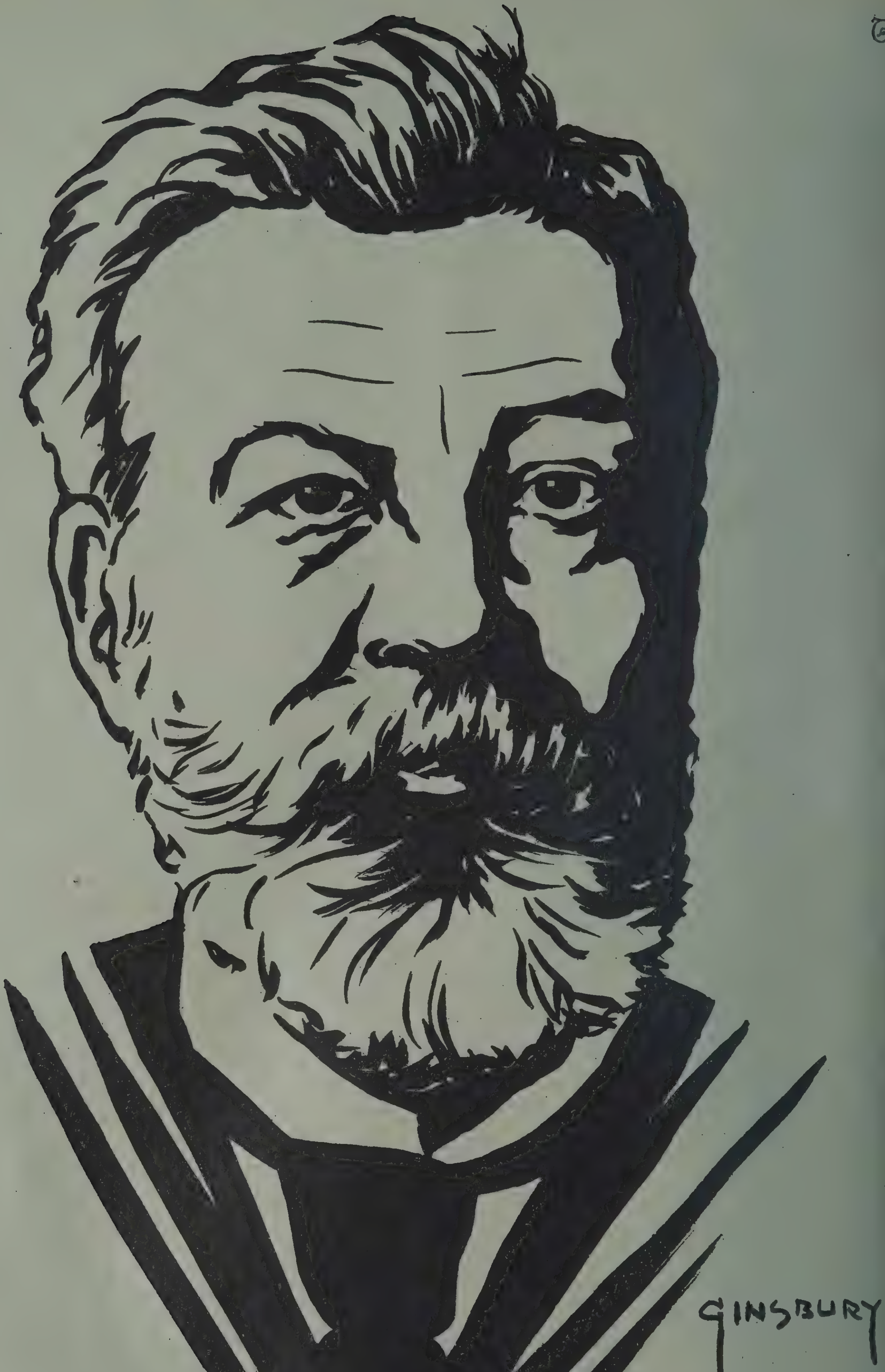
A painter or a sculptor may be able to forecast fairl accurately the work involved in any case, and may thus nam a definite fee, with some expectation of its proving just; no do the uncertain factors exist respecting his work such as a architect experiences by reason of (*a*) the necessary labour being effected by other hands than his own; (*b*) the unknow troubles lurking respecting soils, easements, and tiresom neighbours; and (*c*) the whims of the client not necessaril involving "extras." Consequently, the percentage system however unsatisfactory, seems better to meet the requirement of the case, dealing as it does automatically with rise or fall i expenditure.

Consider this. If, say, a church costing less than 2,000*l* commands one fixed fee, and a church of value from 2,000*l* to 3,000*l*. commands another, will not the average client objec to pay the higher fee on a 2,005*l*. church? And if the contract be for, say, 1,999*l*. 19*s*., subsequent extras to the value o 2*s*. will give rise to the unworthy suspicions to which you refer and in a more pronounced form than under the percentag system, as the "quantum meruit" in such a case would be to trifling to admit of suspicion even on the part of a clerica client.

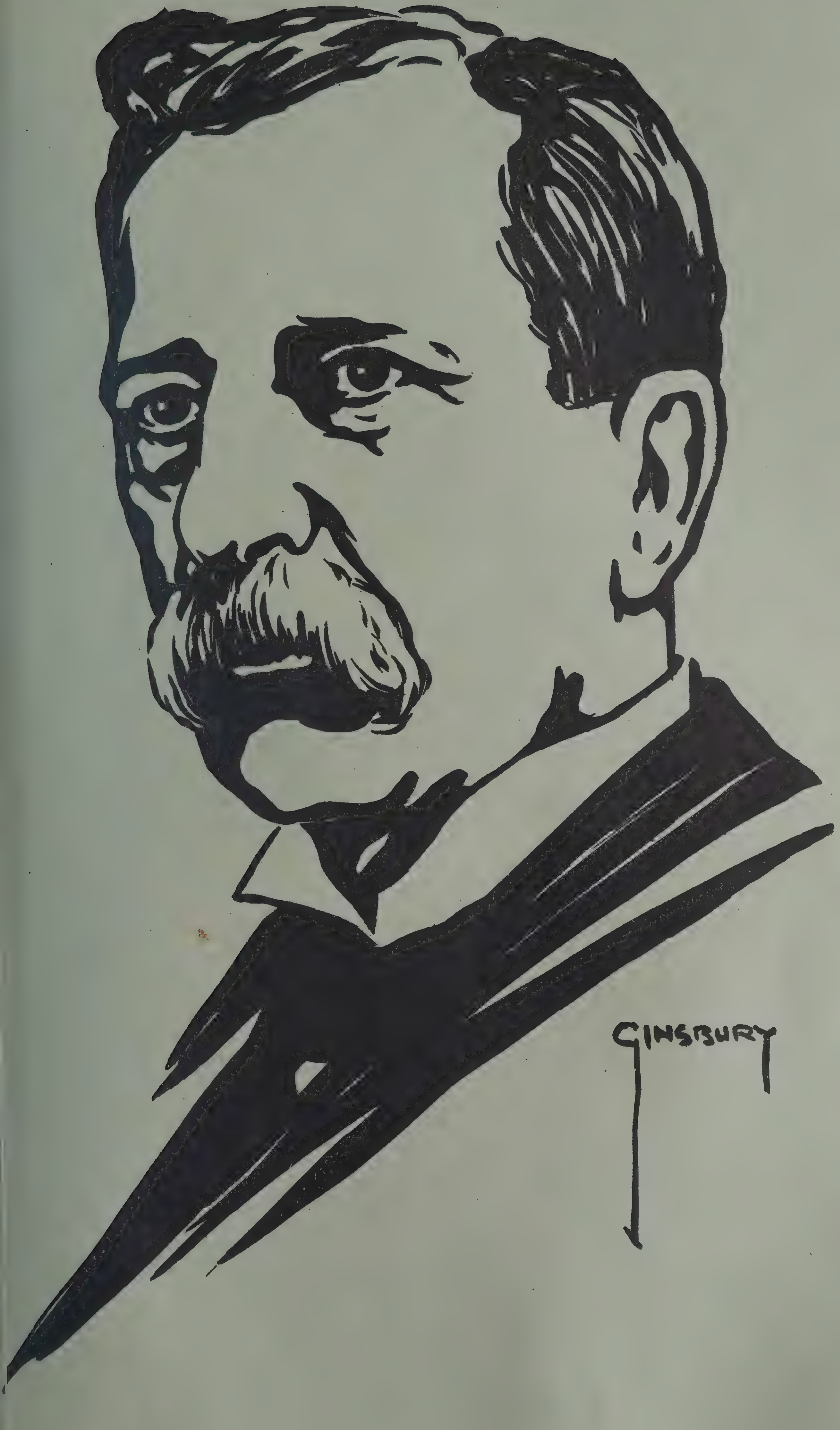
Does the remedy consist in the client swearing that he wi not permit of any extras? One of mine tried that once, an necessary extra expenditure arising, it was borne by the complaisant contractor.—Faithfully yours,

Percy L. Marks.

49 Queen Victoria Street, E.C.: April 12, 1910.



Living Architects. No. 32: Mr. John Douglas.



Living Architects. No. 33: Mr. Wm. Henman, F.R.I.B.A.

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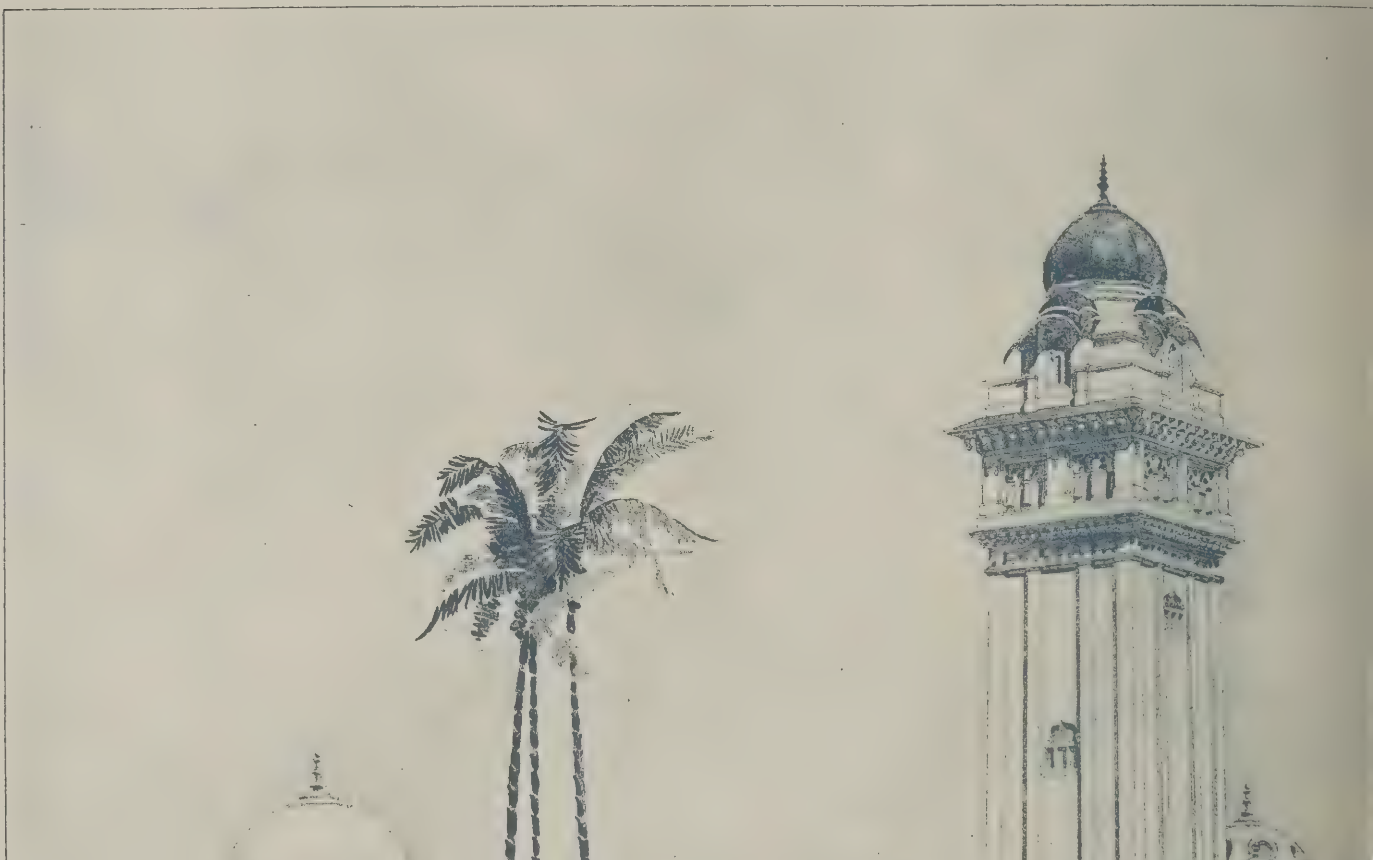

PROPOSED DESIGN FOR GOVERNM

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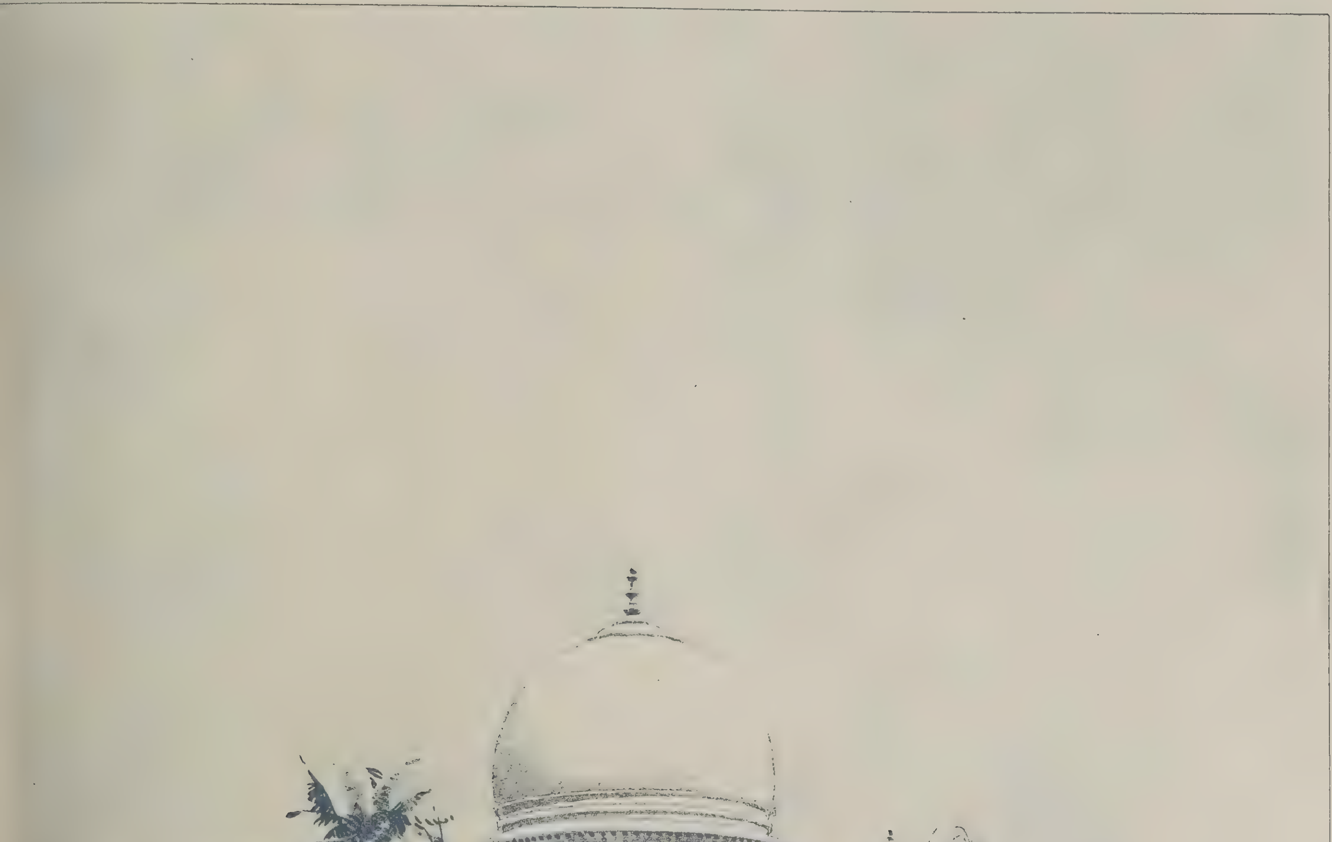

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IDINGS IN A TROPICAL CLIMATE.

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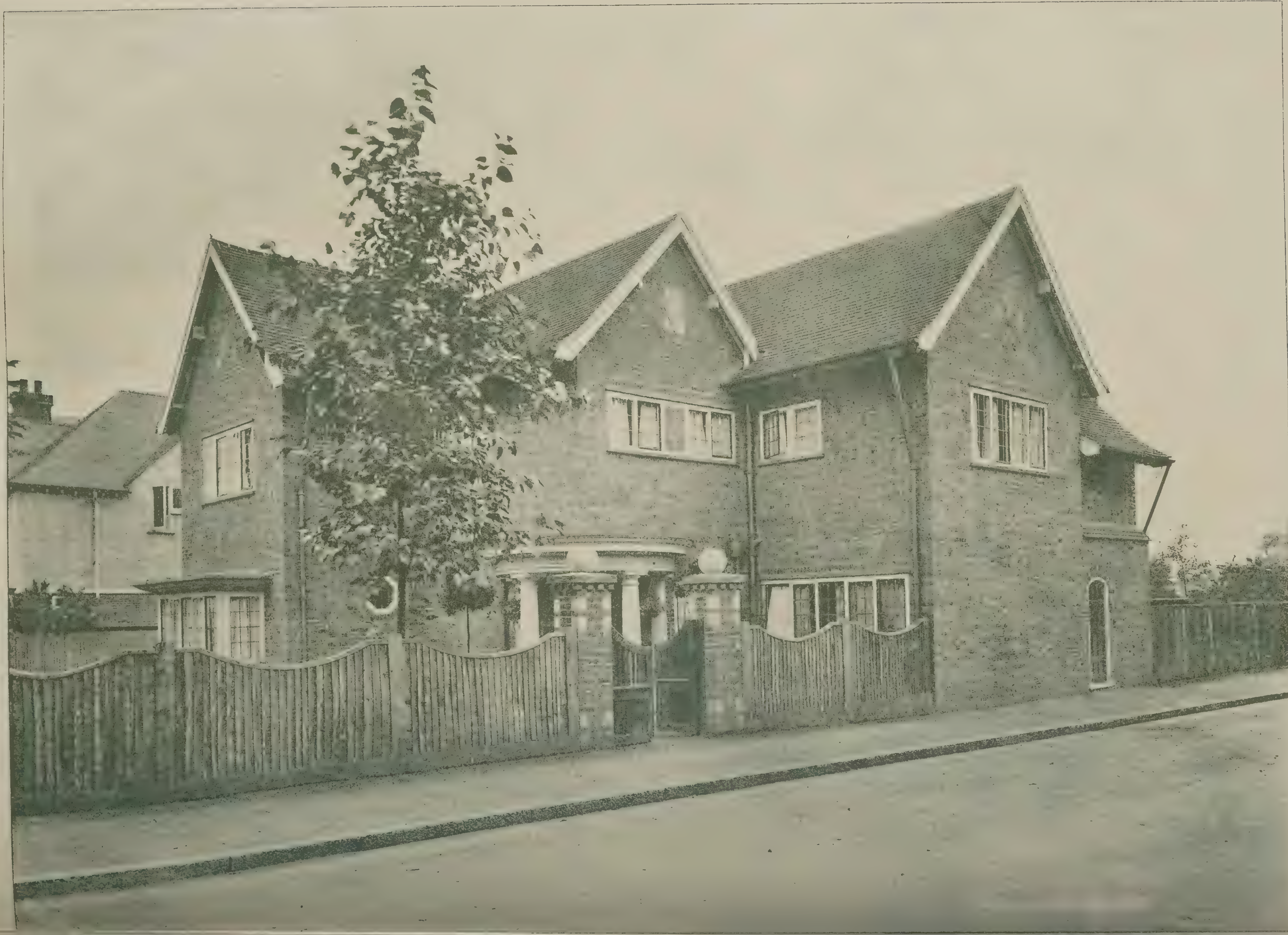
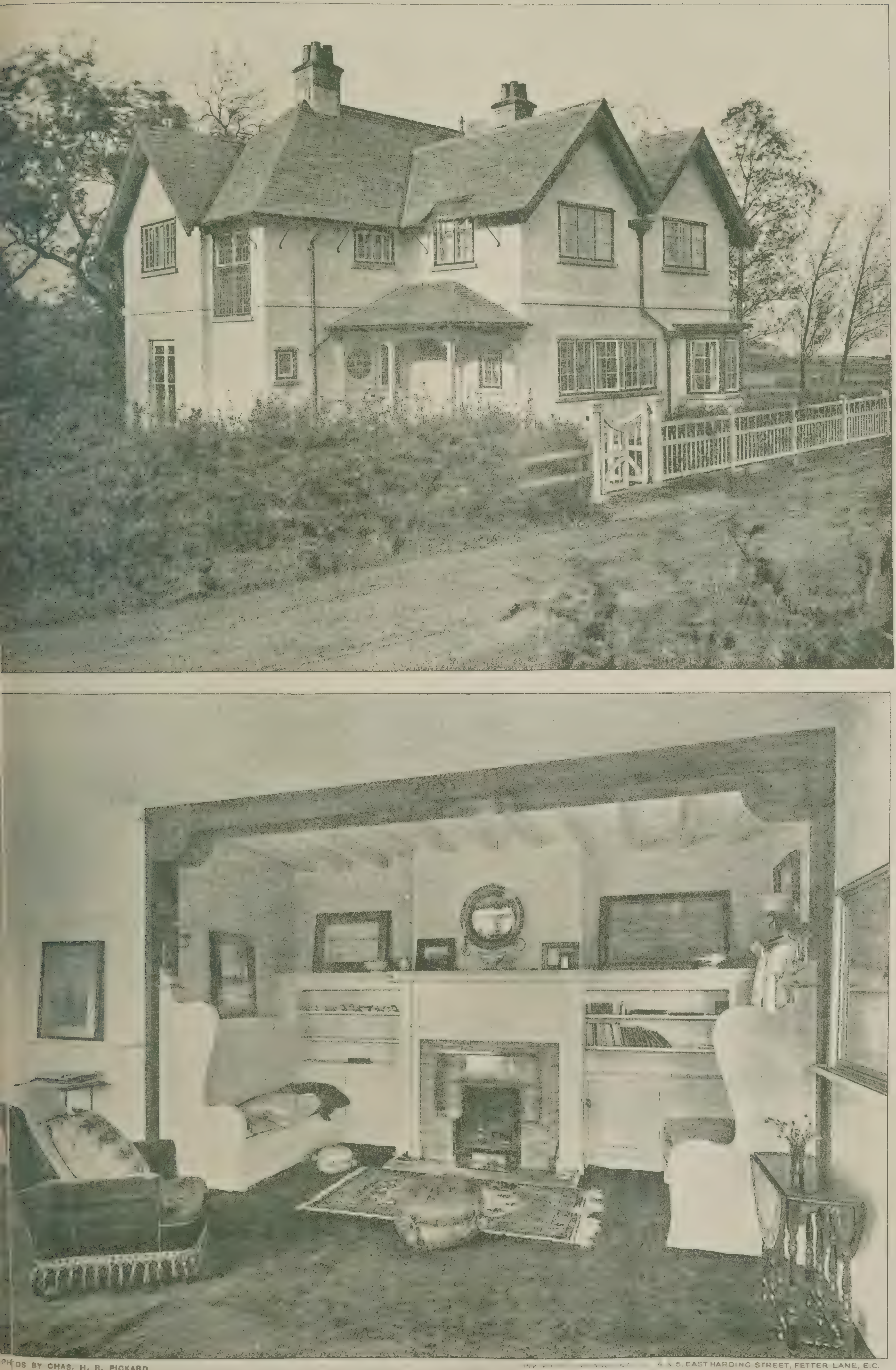
The Architect, April 15th 1910.





PHOTOS BY CHAS. H. R. PICKARD.

[illegible] 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE "WOOD HUT," FYLINGDALES.

MR. H. A. CHAPMAN, A.R.I.B.A., Architect.

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# The Architect.

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## FORTHCOMING EVENTS.

*Monday, April 25.*

Royal Society of Arts : Mr. A. B. Searle on "Modern Methods of Brickmaking." (Cantor Lecture 3.)

British Constitution Association : Meeting at the Whitehall Rooms, Whitehall Place. Paper on "Building By-laws," by Mr. R. M. Lucas, F.R.I.B.A.

*Wednesday, April 27.*

Manchester Society of Architects. Annual General Meeting.

*Friday, April 29.*

Architectural Association : Paper on "The Architecture of Bath," by Mr. Mowbray A. Green, A.R.I.B.A.

Royal Sanitary Institute : Meeting at Worcester. Discussions on "Teaching of Sanitary and Domestic Science in Schools" and "Building By-laws Reform."

*Monday, May 2.*

Royal Institute of British Architects : Annual General Meeting.

## WATERPROOF BUILDING.

THAT ordinary building materials are porous we all know, and although by careful selection of brick and ne and using them in sufficient thickness we generally ceed in erecting structures that do not visibly or iceably permit the transmission of damp under normal ditions of weather, yet there are occasions on which ething more efficient is required to prevent the actual etration of water into a building.

Basements and sub-basements have to be constructed these days of high ground rents and limitation in laws of height of buildings. Riverside structures have resist the percolation of water not only through their ls but through their floors. Swimming-baths and er tanks, including lily-ponds in gardens, have to be structed.

Waterproof building in Great Britain has received less eful attention than in the United States, and much be learnt from the experience and experiments of our eagues across the Atlantic. In particular, the value oncrete as a resistant of water pressure on its surface f exceedingly dubious character, owing to an incom- le study and comprehension of its idiosyncrasy. As MARSH says, "There is no doubt that reinforced con- e standpipes have been constructed which have with- d considerable heads of water, and it is equally certain very many reinforced concrete reservoirs and tanks more or less."

What Mr. MARSH predicates of reinforced concrete ies also to concrete without reinforcement. It can be, has been, made water-tight without apparently special al, and in other cases has proved pervious. Generally king the elements that go to the making of water- f concrete are a correct proportioning of coarser and particles of the aggregate and of the matrix to ensure nce of voids, and the mixing and placing of the con- in dry and cold weather.

When really waterproof qualities in walls and floors been required, architects in this country have been to rely on asphalte or other bituminous material. may be applied either upon the surfaces or within tructure as a shield or membrane. When applied to ces these may either be external or internal surface, is, the bituminous membrane may either be between all or floor and the water, or may have the permeable between it and the water. In either event it is to injury on its exposed surface, and in the latter has also to be made capable of resisting detachment its support by water pressure.

ence has arisen the practice of forming a bituminous rane within the substance of walls by pouring the d composition in a fluid state into a hollow. In this way a thoroughly satisfactory result can be obtained, but is dependent on the homogeneous and uninterrupted continuity of the membrane. On the other hand, this method has repeatedly failed. Failure has resulted usually from one of two causes—incomplete filling of the hollow space, low melting point of the compound. The incomplete filling may be caused by mortar droppings or other obstruction in the hollow, or by the lack of sufficient fluidity in the material to ensure the run being completed before congelation. The fluidity of a bituminous composition thus used is produced by heat, and if the heat is not sufficient, or the hollow too small, the fluidity may speedily be reduced by cooling to a point of insufficiency. The hollow should never be less than three-quarters of an inch wide, and in many cases an inch is necessary. Workmen are sometimes tempted to increase the fluidity of a bituminous composition at a reduced temperature by adding tallow, oil, or other foreign material, and the compound may thus be brought to so low a melting point that the heat of the sun may so far soften it as to allow it to weep through the joints of the outer skin of the wall. Thus the continuity and efficiency of a bituminous membrane poured into a hollow space cannot be regarded as absolutely certain.

Therefore asphalte or other bituminous compound is preferably to be used as an applied coat, protected by an additional thickness of wall or floor. Care must be taken that the compound is neither hard and brittle with a high melting point, nor brought to so low a melting point for the sake of elasticity that it readily softens from the heat of the sun. Caution must also be exercised that in the adding of the protective coat injury is not caused to the waterproof membrane.

Bituminous coatings applied cold are in use for the interior surfaces of exposed walls or for the exterior of foundations not subject to water pressure. These are made up of specially selected asphaltes dissolved in carbon bi-sulphide or some kindred hydro-carbon, the proportions varying according to the use to which the same is to be put. This class of damp-proof paints is more in use in America than here.

A method of waterproofing by the use of surface washes that is of old standing in this country is SYLVESTER'S soap and alum process. In this a hot solution of soap, prepared by dissolving ¾ lb. of Castile soap in one gallon of water is first brushed over and into the surface of the brick, stone, or concrete and allowed to dry for twenty-four hours. At the end of that time a second wash, consisting of 2 oz. of alum dissolved in one gallon of water, is applied at a temperature of from 60° to 70° Fahr. The double operation is to be repeated as often as necessary, but four such coats are said to be impervious to a head of 45 feet of water. The aluminium oleates formed by the process fill the pores of the material with a water-repellent.

Several variations of this process have been employed, in some of which the alum and soap are mixed before application; whilst in others they are applied separately, sometimes the alum first, sometimes the soap. Other variants are chopped suet and lime, caustic potash and alum. All of these are intended to induce the formation of aluminium or calcium oleates or of aluminium hydrated oxide. In some instances stearates are sought in lieu of oleates by the employment of stearine or other fatty acid.

Paraffine wax is another material that has formed the base of several waterproofing methods. It may either be applied under heat or dissolved in a volatile vehicle with the addition of resin as a hardening agent.

Bituminous felts can also be used, preferably on floors and roofs or other horizontal, or approximately horizontal, surfaces. These should be laid in several thicknesses, three or four-ply, and may with advantage be finished with coatings of asphalte and protected from the sun's heat by gravel or concrete.

We now come to the class of waterproofing materials added to concrete or cement rendering to render this impermeable to water even under pressure. Sometimes these are added to the water with which the cement or concrete is mixed, and then are usually some form of calcium chloride, aluminium sulphate, oil emulsions, or soap and alum. Other materials are added as dry powders to the cement. These are generally sold under trade names, of which there are many in America, represented principally in this country by Medusa, Ceresit and Solita. Their precise composition is kept secret by their makers, but they are usually composed of hydrated lime and metallic stearates, or formed by the mixture of chloride of lime and stearic acid; in some of these compounds alum and clay are added in varying proportions.

The effect of this class of compounds upon the cement used for concrete or rendering is to somewhat retard the time of setting, to decrease the strength of neat cement, to increase the strength of cement mortar, to increase the adhesive power of old to new concrete, to fill the pores of the concrete or cement with a water-repellent.

The permeability of the best-known of these compounds, as used in the United States, exists at first to a slight extent, but varies with different brands. After twenty-eight days they are all practically impermeable. In the application of these materials to walls leaking under pressure it is advisable to relieve this pressure by drainage until the applied rendering has set and hardened, when its adhesion to the wall is sufficient to prevent subsequent blowing.

Useful information on American methods may be obtained from a reprinted paper on "Waterproofing," by Myron H. Lewis, C.E., published in this country by Constable & Co.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

We reproduce in monotint the prize drawing for March, but as this does not convey all the charm of the author's colour, the original can be seen, framed and hung up in the Editor's room, by any member of the Club who likes to call at our offices.

The sketch represents the entrance of the tower at Bolton Abbey, Yorkshire.

The Priory was founded about 1120 A.D. at Embsay, near Skipton, by the regular canons of St. Augustine, but thirty years later was removed to its present position.

In plan it takes the form of a Latin cross; the portion west of the crossing is used for services, the remainder is in ruins, probably on account of the rule that the nave was reserved for public use, while the choir was kept exclusive for the canons.

A good deal of Norman work remains in choir and transepts and some fine wall arcading.

The upper portion of the choir and transepts appears to have been rebuilt and Decorated windows inserted.

The nave retains much of its Early English character;
the aisle is divided from it by four arches, and in t
clerestory over are four lancet lights.

The thirteenth-century west front is perhaps the mo
beautiful of all the work, and is in a good state of preserv
tion owing to the protection afforded by the tower erect
at the beginning of the sixteenth century, but not complet
before the Reformation.

This tower is a very fine example of Late Perpendicul
work, especially in proportion and fine detail, the moul
ings and carvings being exquisitely worked.

The date 1520 is carved in the inscription over the doo
way. Had the tower been completed, we should probab
have had no thirteenth-century west front, as the tow
would no doubt have been connected to the nave.

## NOTES AND COMMENTS.

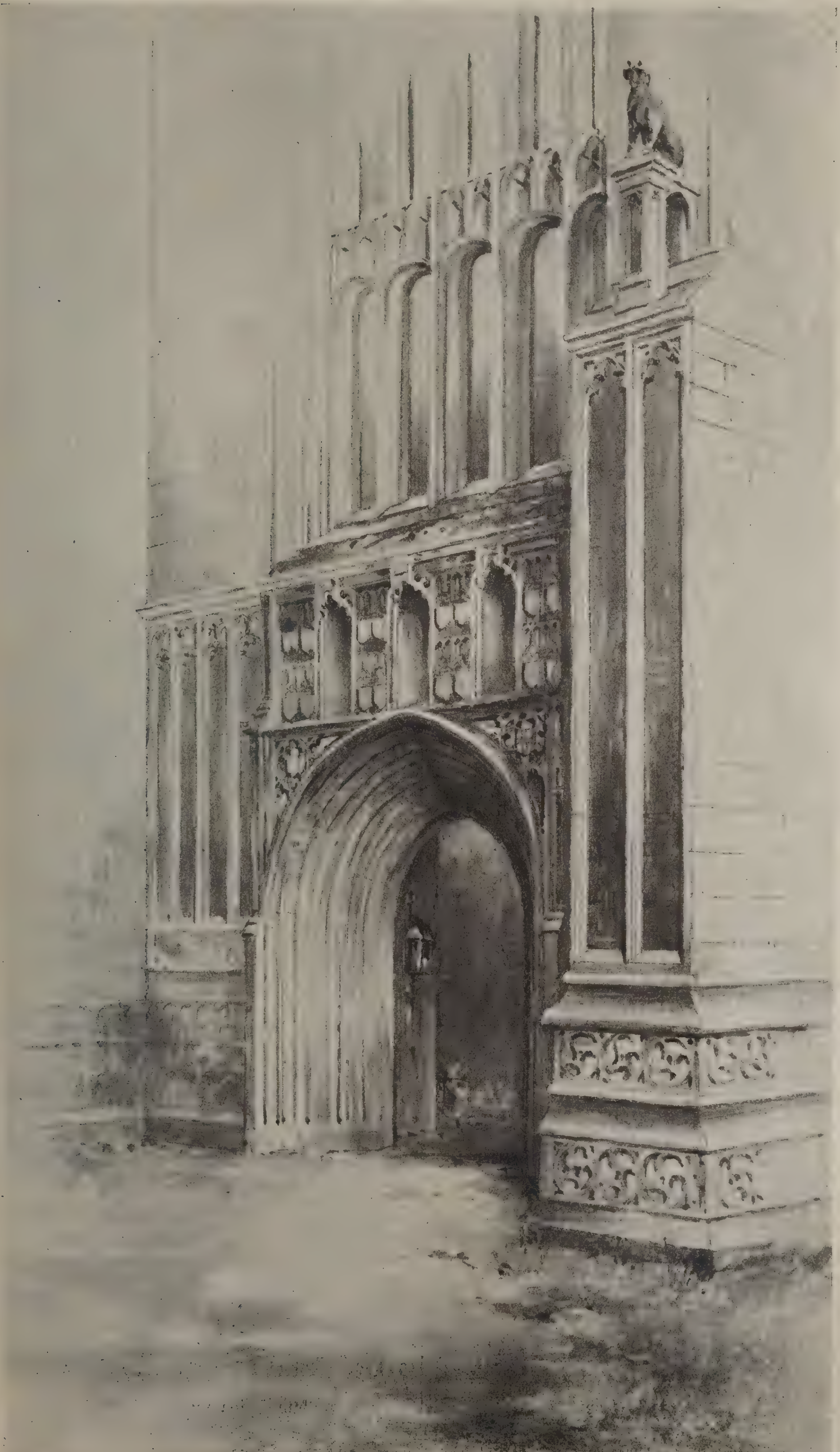
The announcement has been made that the Spec
Parliamentary Bill Committee of the Council of the Ro
Institute of British Architects has reached the final sta
of its work, and the Institute solicitors are now drafti
the Bill. The objects of the Bill, as defined by the Reso
tion of the Royal Institute at the meeting held on March
1907, are:—(1) To declare that it is in the public inter
to enable the public to distinguish architects recogni
as qualified by a competent authority from those not
recognised; (2) To extend the present chartered privile
of the R.I.B.A., making it the statutory authority for
education and examination of architects for admission
the Institute; (3) To legalise a scale of charges.

Applications for admission to the class of Licentia
of the Royal Institute of British Architects are be
received in considerable numbers, showing that archite
throughout the country who have previously held a
from membership of societies are realising that the po
now adopted by the Institute is a sound one, and that
to their advantage as well as their duty to associate th
selves with the corporate representative body of the
fession. As the opportunity for joining the Class
Licentiates ceases on March 23 next, it is essential tha
architects who wish to be recognised as qualified sh
at once proceed to enrolment in the ranks of the Insti
or one of its Allied Societies.

Mr. Walter Runciman, President of the Boar
Education, has appointed a departmental committe
consider and report upon the functions and constituti
the Royal College of Art and its relations to the Schoo
Art in London and throughout the country. We t
there is occasion for such a committee. Good wo
being done by the Royal College of Art, but its pos
and influence are not what they should be. In parti
the relations between the Schools of Art and the
College require co-ordination. There is a grand o
tunity for the committee to show its ability in organisa

We regret to have to announce the death of
Campbell Douglas, F.R.I.B.A., one of Glasgow's
and most distinguished architects. Mr. Camp
Douglas was born in 1828. He was educated part
home and partly at the University of Glasgow, and
business on his own account in Glasgow in 1856.
with his partner, Mr. John J. Stevenson, he did
good architectural work, and among other buil
erected from his designs were Kelvinside United
Church and Townhead Parish Church. On Mr. St
son leaving for London, Mr. Douglas assumed
James Sellars as a partner, and during the foll
years until the death of Mr. Sellars in 1888 the
carried through a large amount of important work, s
of the buildings erected from their designs being a
the chief architectural features of the city. Examp
their work in which Mr. Douglas was chiefly conc
are the St. Andrew's Halls, which were orig
planned by Mr. Cunningham, the designer of the
pool Philharmonic Hall, but which were ulti
altered in detail by Messrs. Campbell Dougl
Sellars; Kelvinside Academy, the Victoria Infir

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



BOLTON ABBEY, YORKSHIRE.—Prize Drawing for March by "ESEK" the Sick Children's Hospital, the New Club, Netherhall, the residence of the late Lord Kelvin, at Largs; Mugdock Castle, and a large number of churches in Glasgow, Edinburgh, and other parts of the country. Mr. Sellars was succeeded in the firm by Mr. James Morrison, and while he remained a partner with Mr. Douglas the second section of the Victoria Infirmary, for which in Mr. Sellars's time designs had been provided, was completed, and the Sandeman Library, Perth, and the Ayr Free Library were also designed.

The special site committee of the City Council of Manchester has come to the decision that the only satisfactory method of dealing with the old infirmary site is to build upon it a new Art Gallery and Central Library. The site was sold by the infirmary trustees with the tacit understanding, from which nobody dissented, that, as stated at the time of the sale by the late Mr. John Thomson, the chairman of the Board of Governors, it would be used to secure for the city an unrivalled site for public buildings and an extent of open space which it would be beyond the reach of a private individual or business syndicate to obtain. The proposals of the special site committee will, if they are carried out, secure both the public building and the open space. The streets around the site have already been widened considerably, more open space has thereby been secured, and the value of the site itself increased largely. The committee propose to occupy only 5,500 square yards with the new art gallery and library building. The old infirmary buildings covered 6,600 yards, so that the city will under the scheme secure 1,100 square yards more open space than was the case when the infirmary stood upon the site. They suggest, too, that the buildings should be set well back from Piccadilly to ensure a noble stretch of open land in the front of the Municipal Art House.

On Saturday last Mr. T. R. Ferens, M.P., opened the new art gallery at Hull, which has been designed by Mr. Hirst, the city architect, who has embodied in his scheme some of the best features of the Continental galleries. Enclosed within three windowless walls, whose surface is broken only by decorative panels, each bearing the name of a great painter, are a series of four galleries, named after the four points of the compass, with a lofty domed circular gallery in the centre, which may probably be reserved for the immortals, as in the "Tribuna" of the Uffizi in Florence. The east and west galleries are each 90 feet by 30 feet, the north and south galleries being 30 feet square. Perfect silence is secured by the solidity of the outer walls, the absence of external windows, and the double roof, which also serves to diffuse the light. Daylight is filtered through two crystal roofs, and at night a number of powerful electric arc lamps are switched on outside the skylights. The four galleries are paved with parquetry in oak, mahogany and ebony, and have dados of walnut, while the central gallery, with its marble columns, is arcaded for the reception of sculpture, and is paved with Italian terrazzo in black and white. From the principal entrance in Carr Lane, on the south side of the building, the galleries are approached by a marble staircase, and through a vestibule with a finely modelled plaster ceiling. The scheme of decoration is rich though simple, and the air of Classic repose and dignity is successfully preserved. Mr. Ferens, in the course of his opening speech, promised an annual donation of 1,000*l.* a year for the purchase of pictures for the new gallery.

The vital importance to the beauty of London of the adoption of a worthy design for the new St. Paul's Bridge over the Thames has impressed itself upon the minds of the members of the Royal Academy, and is expressed in a letter to the *Times* signed by L. Alma-Tadema, Thos. Brock, John Belcher, Reginald Blomfield, George Frampton, Ernest George, John S. Sargent, Hamo Thornycroft, and Aston Webb. They say of the proposed work:—"This scheme when carried out will leave an indelible mark on the scenery of the river, and, according as it is handled, may be a magnificent approach t St. Paul's Cathedral, or a monumental fiasco." Wit this every lover of art and of London must agree. W have not a single bridge across the Thames that can b placed in the same class with what may be seen at Pari Berlin, Vienna, or Ostend, and the Corporation of th City of London should endeavour to obtain an adequa return for the expenditure of the Corporation funds n only from a practical but from an artistic point of vie and to this end should afford the fullest opportunity "f the expression of competent opinion and criticism of t design proposed."

The Royal Archæological Institute is about to i augurate a new departure which, we think, should decidedly valuable and popular, in the form of meetin in and around London for the study of ancient buildin on the spot. The first of these is to be to Westminst Abbey, and will occupy two days, Tuesday, May 10, a Wednesday, May 11, from 10 A.M. to 4.30 P.M.

We regret to have to announce the death of Mr. Lew Foreman Day, F.S.A., which occurred on Monday la Belonging to an old Quaker family and with Welsh blo in his veins, Lewis F. Day was educated at Mercha Taylors' School, followed by two years in France a one in Germany. On leaving school he became apprentice at the works of Lavers & Barraud, t glass painters and designers in Greek Street, Soho. He he laid the foundation of his practical knowledge of artis crafts. Later he went to the workshops of Mess Clayton & Bell, the well-known stained-glass work of the mid-Victorian period, and spent one or two ye in executing special glasswork for Eaton Hall, for t late Duke of Westminster. He was one of the p moters of the Arts and Crafts Society, a Past Master the Art Workers' Guild, and a Vice-President of Society of Arts. He delivered several courses of Can Lectures, two courses at the Royal Institution, and seven years or more an annual course to the Natio scholars at South Kensington—all on practical des and ornament. Both by his oral teaching and by text-books, "Every-day Art," "Nature in Ornamen "Pattern Design," "Art in Needlework," "Ornam and its Application," and others, he exercised a very g influence on modern design as applied to industry, there is hardly a branch of manufacture into which or ment enters that has not felt his influence.

## COMPETITION FOR PROPOSED USHER HA EDINBURGH.

THE conditions of this important competition provide the expenditure of 65,000*l.*, with Sir Aston W C.B., R.A., as assessor, Mr. James A. Williamson, City Architect being associated with him. Sir As Webb has not seen his way to accede to the reques suggestion made in an open letter that appeared in columns and those of our contemporaries, but requ the designs submitted in this competition to be illustr by plans of each floor, two main elevations, two sect —longitudinal and transverse—as required to fully il trate the design. These to a scale of 16 feet to an i and in addition one external bay, one internal bay half-cross section of the hall to 2 feet to an inch, exterior and one interior perspective view of the hall

To take part in this competition will therefore ne heavy expenditure on the part of each individual archi and the profession as a whole would be well advised t it alone. The net profit to the successful architect hardly be more than 1,500*l.*, the competition draw will probably cost each participant from 150*l.* to Is the chance of winning worth the gamble at 10 to 6 to 1? We think a flutter in rubber or oil would be b business.

The accommodation required includes a hall to 3,500 people at musical performances, a crush hall lounge foyer, cloak and retiring rooms, kitchen and ive offices, public office for hall-keeper, ticket-boxes, main, ubsidiary, service and escape or emergency staircases, pace for grand organ, retiring rooms for male and female rtists, retiring rooms for male and female chorus, room or instrumentalists, chamber for boiler, heating and ventilating plant, and coal stores, storage for platform seats, ousemaids' and cleaners' stores and such other subsidiary ccommodation as in usual in buildings of this class.

The site is of an irregular shape at the junction of Camridge Street, Lothian Road and Grindlay Street, and has maximum difference of level of between 9 and 10 feet, so here is ample scope for a considerable variety of treatment nd a fine opportunity for the waste of time and labour y an error of judgment in the initial conception of a cheme.

Designs have to be sent in by July 9, and questions as o the conditions and requirements have to be sent not ater than April 30, so when the replies to these are reeived there will probably be about six weeks clear for the reparation of the drawings. The competition is attractive rom its importance and the opportunity it affords of naking a fine design, but from a business point of view lecidedly undesirable, in our opinion.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Royal Institute was held on Monday, April 18, when Mr. Ernest George, A.R.A., the resident, occupied the chair. The Secretary announced the ecease of Sir W. Quiller Orchardson, R.A., honorary member, notable example of whose work as a portrait painter was the nstitute's portrait of the late Mr. A. Waterhouse, R.A.; also he decease of Mr. W. Owen, retired member, and of Mr. ionel Gordon Detmar.

Professor W. R. Lethaby, F.R.I.B.A., then read a paper n

### The Architecture of Adventure.

By the architecture of adventure Professor Lethaby said e meant that spirit of experiment in building which has been he living force and active principle of all architecture. If it desired to give two separate though consistent meanings to he words architecture and building, by the first we must ean building enhanced by sculpture and painting—that is, uilding completely furnished as Morris says. In any case ere needful and experimental building is the main subtance, force, and origin of the art. So far as it has to meet anging conditions and ideals it must be experimental. herein lies the present difficulty. From a review of the ttempts made it would seem impossible to continue in old ays or revert to past types. We have passed into a scientific ge, and the old practical arts, produced instinctively, belong a different era. History shows that any basis on which ere can be general agreement over a long space of time will roduce architecture of a sort. The one thing essential is this greement, so that a process of development may be set up continuous experiment. The only possible basis of agreeent at the present time is the scientific method.

The Greeks probably took over the notion that architecture as to be reached through a system of ratios from the gyptians; in any case it belongs to many ancient peoples. reek thought on the matter was very clear-cut, and with em proportion meant a definite pre-arranged relation of easured quantities. Polycletus, the sculptor, wrote, Success in art is attained by exactness in a multitude of ithmetical proportions." Greek artists all agreed to such theory. Notwithstanding this their architects, as a matter fact, seem nearly always to have been engineers. The gineering element in Roman architecture is most marked; d it was this indeed which entirely burst the old bottles tradition and transformed the art into one of daring ructural adventure. Most of the great Roman architects em to have been engineers in the strict sense. The identity tween engineers and architects continued into the Byzantine riod, and into the Middle Ages. The great Mediæval ildings are solutions of problems of how to throw stones gh into the air and balance them there. A great French stle or cathedral was not designed as beauty, it was developed ng a line of experiment as surely as the great ocean liners being so developed.

With the Italian Renaissance men there was a set-back. e mighty architecture of ancient Rome was studied cernly, but for the mere fashion of outward adorning and t for its science of construction. The notebooks of nardo da Vinci, however, are full of practical exercises and experiments. Indeed he was the first to enter on a systematic inquiry as to the mechanics of architecture. Amongst his schemes was one for a town, for he was a pioneer in town planning as well as in aviation. The only other artist of the Renaissance who caught the idea of investigating principles was Dürer, and he possibly had access to Da Vinci's notes. In his manuscripts in the British Museum are some studies of domes of a parabolic section and some exercises in plan schemes.

Although Wren was not a world-genius like Leonardo da Vinci he was in many respects an English Leonardo, and the one architect we have had whose formal thought (as opposed to the flashes of insight of a dozen men like Pugin) matters. More even than a great artist, Wren was a great man. Robert Hook, another scientific architect and his friend, says of him, "Since the time of Archimedes there scarce ever met in one man in so great a perfection such a mechanical hand and so philosophical a mind." Wren was almost certainly the first in England to apply the methods of scientific investigation to the laws of structure, and Hook is said to have been the first who stated the mechanical properties of the arch.

It seems clear that Wren contemplated writing a history of architecture and also a general philosophy of its first principles. The notes were probably written when, over eighty, he had retired from active work to pass his time in contemplation and studies. His intention appears to have been to give "a larger idea of the whole art" of architecture, beginning with the reasons and progress of it from the most remote antiquity, and thereby to reform the generality to a better taste.

Architecture aims at eternity, and therefore is the only thing incapable of modes and fashions in its principles. "The orders are not only Roman and Greek, but Phœnician, Hebrew, and Assyrian, being founded upon the experience of all ages, promoted by the vast treasures of the great monarchs and skill of the greatest artists and geometricians, everyone emulating each other." The orders, that is, were admirable so far as they embodied much experiment and long experience. He complains that while architects dwell too much on the ornamental side of architecture they slightly pass over the geometrical side, "which is the most essential part of architecture. For instance, can an arch stand without butment sufficient? If the butment be more than enough it is an idle expense of materials; if too little it will fall; and so for any vaulting; and yet no author hath given a true and universal rule for this nor hath considered all the various forms of arches." Wren then investigates the laws of stability by consideration of the centres of gravity of the several parts, and concludes:—"The design where there are arches must be regulated by the art of statics and the duly poising of all parts to equiponderate. Hence I conclude that all designs must in the first place be brought to this test or be rejected." He says that he adopted the form of vaults used at St. Paul's from Sta. Sophia "because it was the lightest manner and requires less butment; I have therefore preferred it to any other way used by architects." Some sketches for the great dome show that its section was conceived as conforming to a general parabolic curve rising from the plinths of the great piers and passing through the abutments and over the crown of the so-called cone. Wren saw, and probably was the first of architects to do so, that necessity, which he equates with nature, must be one with beauty.

There is a view as to the meaning and content of architecture which holds that it is primarily building according to the natural laws of structure and stability, according to need and order, and always with care and finish. That it must ever vary with ever-changing conditions, and that this ordinary building may have associated with it painted and sculptured stories, or inlays or fretted works and gildings, while the essential architecture is still structure, and the method of architectural growth is by continuous experiment in the possibilities of structure. Nevertheless it should be clearly understood that any quest for originality just blocks the way, with our preconceptions and limitations, to any possibility of realising a true originality, which properly is of the root, not of the appearance. True originality is to be found by those who, standing on the limits of the sphere of the known, reach out naturally to some apprehension and understanding of what is beyond; it is the next step in an orderly development.

What should be urged is concentration on practical, experimental, and scientific education. What we most need at the present time is the accumulation of power; we want high mechanical training, wide practical experience, and great geometry. And then we want to cover the field by a systematic research into possibilities. The possibilities of walls and vaults, and of the relation between the walls and the cell, and between one cell and another, want investigating. It is true such a training would not include the whole of architecture, but it would open the way to the best we can attain. We might hope thus to give up hugging the coasts of the known, to sail boldly forth under the stars. Thus, and thus only, may we enter again upon the architecture of adventure.

Building has been, and may be, an art, imaginative, poetic, even mystic and magic. When poetry and magic are in the people and in the age they will appear in their arts, but there is not the least good in saying, "Let us build magic buildings. Let us be poetic." Yet it is because these things are wanted that this problem must be faced.

Something desperate must be done. We should devote the next session to papers on constructive science, get Professor Karl Pearson to give his researches on the arch, Professor Perry to draw up a report on the application of mathematical inquiry to structures, and our Fellow, Mr. Dunn, should lecture on modern constructure problems. As talking of reason in design is to be tabooed as a self-evident truism, someone who is prepared to commit suicide should examine the prevalence of *irrationality* in modern buildings. The scientific side of our examinations should be rapidly screwed up, and the archæological side as rapidly unscrewed. All our travelling studentships should be made to bear on the same quarter. Pugin students should be made to analyse varieties of mediæval vaults, and Soane students varieties of staircase arrangement. Tites should be sent to study French railway stations, Grissells to work at German hotels, and Godwins to American hospitals.

To emulate the highest in our art we need first the natural, the obvious, and, if it will not offend, the reasonable, so that to these, which might seem to be under our own control, may be added we know not how or what of gifts and graces. Thus may we hope to combine the two realities, the reality of natural necessity and common experience, and the reality of the philosophers, which is the ideal, and to reconcile again art with service.

Professor Beresford Pite, in proposing a vote of thanks, said that it was very difficult to listen to Professor Lethaby and to forget his past. He himself could not hear him without being wicked enough to recollect the exceedingly stimulating designs which Professor Lethaby had produced. But their business was not of course to consider what each had done in the past, but rather to set their houses in order with regard to education. It did not carry them very far if they protested against the habit of loading the architectural student with forms of bygone styles and then set him an examination in what he had learnt. The paper just read should, however, at any rate help them further along the road in disassociating antiquarianism with modern architectural education. A practical knowledge of archæology as a living science rather than as a thing of the museums, as rather that which teaches us of their life and methods and gives a vivid realisation of the bygone nations, than being coached in the forms and examined in their reproduction, was vital and essential. It was difficult to be altogether convinced by the theory that Professor Lethaby had advanced. The men he had quoted were all geniuses, and it was dangerous to argue from them. Leonardo da Vinci had been mentioned as a pioneer in town planning as well as in aviation; the same thing could have been said of Dædalus. Great emphasis had been laid on the constructive aspect of Wren's genius, but there was also an extraordinary fluidity in his treatment of the Classic orders, and he breathed a wonderful originality into the style. All this was a pure play of abounding fancy, though behind it was Wren the mathematician and the man of science, as was also to be seen in the work of Leonardo and of Brunelleschi. In such minds there was the perfectly continuous and perfectly proper line of scientific progression, while parallel to it and coupled and united with it ran a stream of artistic sympathy. In some cases the two were not always equal in strength or assertiveness. However the point must not be pushed too far, for if there is nothing else to guide us but our perception of constructive achievement all our delight in past architecture vanishes apart from that single quality. Engineering works had for years impressed him (the speaker) more than any other class of building; they are most impressive to the eye and vastly suggestive to the mind. In the future the Forth Bridge and other achievements in engineering will be gazed at with wonder. But the world will not stop at the point now reached. So far as we are concerned all the effects of everyday architecture are arrived at and obtained. For instance, the necessary knowledge about brickwork is easily acquired. Our buildings will be singularly devoid of interest if we stop there. The only thing that can be done is to hope for that distant view of things which are just visible to us to-day, and which will be crystallised for future generations. In the meantime architects must tak up those forms which are admired by the existing generatio and make them humanised.

Mr. H. H. Statham seconded the vote of thanks for paper which, he said, was not only very interesting, but als one which will be rather a landmark. In regard to the Gree idea of proportion he quite agreed with Professor Lethaby tha it was a definite prearranged relation of measurements; bu if the idea is pushed too far it brings one to the point reache by Pennethorne, that to get the true effects of a Greek buildin you must see it from one point of view and one point of vie only. This was obviously a *reductio ad absurdum.* M Statham said he would like to know why Wren put a secon storey to St. Paul's. He was much struck by the statemen that any strong and general interest felt by a people wi produce a school of art. It was quite true, the one thin necessary being that interest in architecture. He woul venture to ask if there was no other form of adventure besid the adventure of construction. Would we not all be sorry lose those Renaissance palaces? Yet they failed to com under the latter description. Besides, Leonardo da Vin sometimes regarded his work primarily from the architectur point of view. Was not architecture the poetry of plan ar section? Even without its colouring and mosaic Sta. Soph would still be very great art. Mr. Statham said that a go many years ago when staying with the Dean of Salisbury was on one fine afternoon in the cloisters with a lady wh admired sculpture and painting, but who knew nothing abo architecture. She, after watching the wonderful effects the tower and spire, turned round and said, "Well, I belie architecture is the greatest of all the arts." He was willi to accept the spirit of the paper provided that the adventu of construction was recognised as the groundwork for t adventure of design; with that reservation there was much it that was most remarkable and helpful.

Mr. Paul Waterhouse said that one felt with Profess Lethaby that he was one of the men who knew his subje that he really appreciated what architecture was. Not ma did that; most men tended to look at it as a matter of dai business, forgetting its higher aspects. Professor Letha would not, he knew, mind him saying that with many thin contained in the paper he was in disagreement. He was the first place inclined to take a pessimistic view. He cou not help thinking that there was a danger of ignoring t study of the past, and he could not bear to think that you men would come to think that one jot or tittle of their study ancient work was wasted. There was one thing in the pap that struck him as a beautiful definition; it was as follows: "True originality is to be found by those who, standing on t limits of the sphere of the known, reach out naturally to so apprehension and understanding of what is beyond." H he might remark that a man standing on the limits of wh he believes to be the unknown must be very sure that it really unknown. It was difficult to understand what Mor meant when in speaking of the art of the Renaissance he sa that the past slew the present:—"Strange to say to this liv body of social and scientific new birth was bound the cor of a past art. On every other side it bade men look forwa on the side of art it bade them look back." As he hims understood it there was nothing more stimulating than feel in sympathy with some great period of the past. But questions of this kind one does not cease to sympathise w what is being said on the other side.

Mr. Weir Schultz said he entirely sympathised w everything that had been said in the paper. He would rat take exception with what had been said by subsequent speak who seemed to think that if architecture was studied scientific grounds all sense of beauty would be lost. T forgot that Gothic art was the romance of construction. builders tried to see how far they could go, and someti they overshot the mark. If in the future architects go b to the study of construction they will be going to the roo the art, and there will be some hope of a really living ar- tecture again. A great deal was said about the great bea of English domestic architecture; it was scattered all the country, where it was done by the local builders in local way. They were real cottages and real houses. Whe the modern domestic architecture only approximates to th in spite of all the labour put into them by trained archite

A vote of thanks having been passed, Professor Leth replied briefly to some of the points raised. In referrin contemporary work he said that the modern architect see to be dealing with a multitude of flavours that seem like things but are not the things themselves. They reminded of a story he had heard many years ago when a friend of in passing down a back street saw a card in a window say "Fine Jam; Good Strawberry Flavour."

## THE CRAFT OF REPAIRING BUILDINGS.*

*(Continued from last week.)*

A VERY interesting little Gloucestershire church is Coln St. Denys. It has a central Norman tower on which a ifteenth-century belfry has been built. The arches which pierced the east and west walls of the tower were inadequate, and the slope where the Norman work leaves off curves downwards in the middle owing to the arch below having given way. Although very extensive repairs were carried out, he character of the building has hardly been changed. It was thought wise to put the clock to the west of the window, for it had been placed in the middle of the window. The origin of all the trouble was the semi-circular tower arches built in Norman times. The eastern or chancel arch was replaced by a pointed arch in the thirteenth century, but the arch leading from the tower into the nave was retained, and ts shape shows the dangerous condition it was in before it was repaired. By the process, already explained, of replacng little by little old walling by new, a solid band of brickwork the full thickness of the walls behind the stone facings has been inserted in all four walls, thus bonding them together and helping to distribute the weight of the tower over the whole length of walling and thus relieve the tower arches.

Onibury Church, Shropshire, is a good example of a church which has been repaired and made structurally sound and fit for Divine worship without loss of interest. The only exterior change noticeable is the belfry windows having ouvres in them. A stone-paved and slightly sunk wide channel against the walls runs all round the building. This does not look so well as seeing turf coming right up to the walls, but it is very necessary in some cases to keep the buildng dry. When such channels must be used they should be formed of concrete. They should be laid to slight falls leadng to gullies, beneath which there should be glazed earthenware drain pipes taking the water well away from the buildng, and the surface drain should not be less than 2 feet wide, with a long slope from the wall and a quick slope up to the turf, and they should be paved with stone, otherwise the cement always cracks and goes to pieces. It has been very usual when repairing lead roofs to take the lead away and put new milled lead in its place. The late Mr. Crickmay told ne of a case where a church had its north and south aisle roofs covered with cast lead in bad repair. One aisle was renewed with milled lead, and the other was left. This was when he was a young man. He saw the church in after-life, and he new milled-lead roof was in a worse state than the cast-ead one which had been left alone. Milled lead is made into heets by crushing it between rollers until the desired thickness is obtained. This hardens it and makes it brittle and iable to crack. Moreover, age turns it black, whereas lead which is cast into sheets becomes silvery, for it oxidises, so hat the surface gets covered with white lead. I have seen old cast lead looking almost as if it had had a coat of white paint on it. This oxidisation, I believe, acts as a preservative. When repairing timber roofs it is a great gain to repair them *in situ*. Each timber is examined, and the portions which are decayed are cut away and new oak fitted on to take the place of what has gone. There are many ways f splicing wood, and the splice should be so arranged as to ut away as little sound wood as possible from the old work. The worm in old oak can always be killed by saturating the ak with paraffin. Some years ago a parson wrote me an nteresting letter to say that he considered bats were a great reservative of timber; that his church was full of them, nd he would not have them destroyed. As you know, the reature which makes the pin-holes in wood is a beetle, and e found out that it only flies at night. He also found by xamining the bat droppings under a microscope that it was argely composed of the wings of this particular beetle.

West Walton Church, near Wisbech, is a noble thirteenth-entury building with fourteenth-century windows inserted. The nave roof is what is called a hammer-beam roof; that is, nstead of beams going right across at the level of the wall ops, and props standing on them, a bracket runs out from he wall-plate and a prop stands on the end of it. Each racket, or hammer beam as it is called, is carved into the orm of an angel, and each angel holds a shield, and each hield has a different emblem of the Passion on it. It ertainly seems as if the roof was not originally made for his building, as the pieces of timber running down the wall rom the hammer beam, and which are called jack-legs, cut right across the arches of the windows, which on the north side of the church have been blocked up because a high-pitched roof was put on that aisle. Many of these hammer beams were quite hollowed out on the upper side by decay, and had their ends, where out of sight, decayed away. New ends were, of course, spliced on, and the hollow places were cut out square and a new piece of oak fitted in from the back. Battens—that is, long thin slips of oak—were laid along the backs of the rafters on which wide oak boards were laid. This was put back when the repairs were done, and battens laid on the back of the oak boarding, and deal boards on the top of them to carry the lead, which must never rest on oak because the tannin in the oak eats away the lead. Each bay of the roof has a tie-beam, and there are two hammer-beam trusses between them.

There is one important thing to remember when repairing roofs, which is that you can hardly find yourself in a difficulty, because if the carpenter cannot see his way to make a sound and strong job of the work the blacksmith will be able to do so. In one case, for example, where timbers were not sufficiently strong, we cut a groove all down the back of them and then laid a T iron joist on the back out of sight, and with the flange of the T iron let down into the groove. Coach screws were then put in on each side of the flange to hold the steel joist firmly on to the timber. Apart from this, however, timbers can be strengthened by fish plates; that is, a flat iron placed on each side of the timber with bolts running through the timber and holding the iron plates together.

*(To be concluded.)*

## EXETER COLLEGE, OXFORD.

By the Rev. W. K. STRIDE, M.A.

EXETER COLLEGE derives its name from a great bishop of Exeter, WALTER DE STAPELDON, who in 1314 founded "Stapeldone Halle" for the benefit of twelve scholars in the University of Oxford, the statutes containing the proviso that eight of the twelve should come from Devon and the other four from Cornwall. As, to borrow from FULLER, New College is the most favoured by Southern men, Queen's by Northern, and Brasenose by North-western, so has Exeter ever been full of men from the West-country, and to this day, in spite of alterations, nearly half the College scholarships and exhibitions are restricted to natives of STAPELDON's old diocese. Exeter has always been connected with the West, and many well-known West-country names, such as ACLAND, BORLASE, CARY, EDGCOMBE, FORTESCUE, JAGO, LEIGH, ORCHARD, STUKELEY, GRENVILLE, TRELAWNEY, WADE, and YARDE are to be found on the books.

A few of the provisions of the original statutes are curious and are worth recalling. The Fellows were to have their rooms rent free, and each was to receive the magnificent emolument of ten shillings annually. They might have four weeks' "vac." without deduction of this allowance, but if they were away longer they suffered proportionately. They were cautioned against gossiping about the private affairs of the College to the detriment of its members; in all respects they were to "comport themselves with due regard to their dignity as clerics"; black shoes were to be worn, "or shoes as nearly black as possible," and only French or Latin should be spoken at dinner and supper.

Nothing of any special importance happened to the College till the beginning of the sixteenth century. There is the usual ebb and flow and gradual growth, but nothing more. In 1536, however, the College was in a very poverty-stricken state. The annual revenue was only 83*l*., from which 13*l*. had to be deducted for masses and exequies; the Rector's annual allowance was 4*l*., and a Fellow's 70*s*. But a new impulse was given by the benefactions of Sir WILLIAM PETRE, "the second founder." His first step was to increase the endowments, for which purpose he handed over various livings. These benefactions, together with subsequent legacies, more than doubled the revenues, and his services were rewarded by permission to draw up new statutes in conjunction with the Bishop of EXETER. A sub-rector was appointed, and a dean; gaming, shooting, and hunting were forbidden;

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* A paper read at Carpenters' Hall on April 6 by Mr. Thackeray urner, F.S.A., F.R.I.B.A.

dress and manners were carefully regulated; and an attempt was made to stop pluralism. But the most important alteration of all was that eight new Fellowships were instituted, the holders to be elected from any of the counties in which PETRE or his heirs held land. As these included Somerset, Dorset, Oxon, and Essex, and gradually nearly the whole of the south and east of England, it will be seen that the old West-country element was almost swamped. Doubtless this was a good thing, for the conservative influence of the West had been affecting in no small degree the views of the College as regards both politics and religion. Possibly PETRE was more far-seeing than is generally realised.

During the Stuart period Exeter was further enriched with scholarships and grants. In 1636 CHARLES I. gave one of his three Channel Island Fellowships, and about the same time Sir J. ACLAND and Sir J. MAYNARD made grants. A short time before this the Hall had been rebuilt at a cost of 1,000*l.*, of which ACLAND found 800*l.*, and in 1624 a new chapel was erected on the present site, Dr. HAKEWILL, then Rector, giving 1,200*l.* During the Civil War, Exeter, like Oxford at large, remained faithful to the King's cause, and suffered accordingly: 300*l.* and nearly all the plate was given to the King. Under Parliamentary rule, even greater hardships were suffered: the Visitors of 1648 expelled ten Fellows and eighteen others; it was difficult, too, to collect arrears of rent, and some of the Fellowships had to be given up. JOHN CONANT, however, Rector 1649-62, did much towards restoring the College to its former prosperity and discipline.

We may now turn to the buildings themselves. One of the first was, of course, a chapel, situated a little to the north of the present College library; it was used as a chapel till HAKEWILL's building was completed in 1624. It was then turned into a library, which was burnt out in 1709, but continued to be used till 1779, when a valuable legacy of books and MSS. necessitated a larger building, the original library, built in 1383, having been converted into rooms in 1624. The first hall, running north and south, stood in what is now the front quadrangle. The main gate was on the north side of the College; in 1432 a tower and rooms were built over it. This is the oldest part of the College now extant; it is known as Palmer's Tower, and may be found at the east end of the chapel. The present gateway tower in Turl Street was erected in 1605 by one EVERARD CHAMBERS, Fellow of the College.

In the earlier part of the seventeenth century many important additions were made. In 1618, as we have already said, Sir JOHN ACLAND built the present hall and the cellars beneath it. This hall, which is fortunately almost intact, is a good specimen of Jacobean architecture. Not the least interesting detail is to be found on the fine screen—a carving of a man pulling contentedly at a long pipe. The pattern of the roof is peculiar and has been assigned to a later date, but by comparing it with that of Lincoln College Hall, which is known to have been built at almost exactly the same time and is practically identical, we may conclude, as the present Rector suggests, that it was a passing fashion of the day. There was originally a louvre in the centre, but unfortunately this was removed when chimneys and fireplaces were introduced. The present porch and clock were not added until 1820.

The second chapel was erected in 1624 by GEORGE HAKEWILL. It was built on the western part of the present site and consisted of a main chapel and an aisle on the south side. On the west wall there were flat pilasters, on which were musical instruments carved in high relief; these, however, seem to belong to a later date. There was never an east window. A noticeable feature was the ceiling, which was arched and plastered, and painted to resemble fretted stone, and there is still extant an oil-painting of the ante-chapel with chapel beyond which preserves this feature.

Great changes were effected between 1854 and 1860, when the old chapel, the Rector's lodgings, and the library built by CROWE, together with other buildings, were pulled down, and the new chapel and Rector's lodgings, the interior of the small quadrangle, the Broad Street tower and rooms, and a new Gothic library on the site of the old were all erected under the supervision of Sir GILBERT SCOTT. There was no pressing need for the rebuilding of the old chapel, but the authorities were apparently smitten with a desire to destroy, and declared the fabric unsafe. The present chapel is one of the best productions of the Gothic revival and contains many beautiful decorations. We may mention the stained-glass windows put in as memorials, the columns of Devon and Cornish marble, the rose window at the west end, and the mosaics by SALVIATI at the east end. But the great glory of the chapel, and indeed one of the great glories of Oxford, is the exquisite tapestry representing the Adoration of the Magi, designed by BURNE-JONES and executed and elaborated by his friend WILLIAM MORRIS, both of whom were Exeter men. The tapestry, treating the subject in an original way, is almost world famous, and is indeed a wonderful example of the artists' work.

There is much more to be said about Exeter College, but we have room only to attempt a short description o the Fellows' Garden—little known, perhaps, but one o the most beautiful nooks in all Oxford. As if to accentuate its charm, it is first necessary to trek across waste of gravel in the quadrangle and then to plunge mole-like into a dark tunnel hidden away in the fa corner. Having escaped the embracing arms of the common-room staircase the visitor stumbles suddenl into a fairyland—tiny as a fairyland should be. In front on the lawn, is a great acacia, behind which one may se the grey walls of the Old Divinity Schools; to the left i the library; on the wall through which one has tunnelle is a famous figtree named after Dr. KENNICOTT. (Non may escape from Exeter without hearing the story a least once.) Go down the winding path to the terrac at the end and look over the wall. Above are the branche of HEBER's chestnut—which the future bishop, while ye an undergraduate at B.N.C., is said to have found usefu after hours; in front is the Radcliffe Camera, on the righ the walls of Brasenose, and over your shoulder th Selden wing of the Bodleian. We may stand here as it were, in the centre of Oxford's learning, until chancing to glance upward, the eye is caught by th delicate spire of St. Mary's rising at first in intricat grandeur of carving and finally in one straight, pure boun into the heavens, as if to remind us that life holds greate pleasures even than those of earthly wisdom.

## ILLUSTRATIONS.

### EXETER COLLEGE, OXFORD.

WE this week resume our series of views of the Oxfo colleges, and a description of Exeter will be fou on p. 255.

### DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.

THIS design was submitted by Mr. WILLIAM WHIT HEAD, A.R.I.B.A., in the recent competition for t new training college of the city of Leeds, and was one the best of those that were not fortunate enough to recei reward at the hands of the assessor.

DURING last week important excavations were carri out on the site of Malmesbury Abbey by Mr. Harold Bra spear, of Corsham. The result has proved highly satisfa tory so far as the cloister is concerned. A large piece of t flooring of the east and west alleys has been uncovere together with small patches of the north alley floor. A ve quantity of fragments of the vaulted ceiling has been fou showing that the cloister alleys were very similar to those Gloucester, but a little later in date. Fragments of the low parts of the inner walls have been discovered at the nor west and north-east angles, and a fine piece near the sou east corner.

## THE SOCIETY OF ARCHITECTS.

THE twenty-sixth annual dinner of the Society of Architects was held on April 15, at the Holborn Restaurant, hen nearly two hundred were present. The chair was occuied by the President, Mr. George E. Bond, J.P., and amongst hose present were the Right Hon. Lord Saye and Sele, Mr. yril Cobb (vice-chairman of the London County Council), Ir. L. A. Atherley-Jones, K.C., M.P., His Honour Judge entoul, Mr. Brook T. Kitchin, F.R.I.B.A. (architect, Local overnment Board), Mr. Herbert Neild, M.P., Alderman Iax Clarke, F.R.I.B.A. (Mayor of Holborn), Mr. H. D. earles-Wood, F.R.I.B.A. (chairman of the Royal Sanitary nstitute), Mr. Henry Tanner, jun., F.R.I.B.A. (president of he Architectural Association), Mr. Fredk. Higgs (President f the Institute of Builders), Ven. William Sinclair, D.D. Archdeacon of London), Mr. O. F. Peall (Master of the ainters' Company), Mr. Leonard Horner (President of the ondon Master Builders' Association), Mr. Alfred Stoner Master of the Tylers' and Bricklayers' Company), Mr. E. J. ilcock, M.Inst.C.E. (President of the Society of Engineers), Ir. Ellis Marsland (Past Hon. Secretary), Professor Henry dams, M.Inst.C.E. (Hon. Treasurer), Mr. William Woodard, F.R.I.B.A., Col. F. S. Leslie, R.E. (Hon. Secretary), Ir. Percy B. Tubbs, F.R.I.B.A. (Vice-President), Mr. . W. S. Cross, M.A. (Vice-President R.I.B.A.), Mr. Valter W. Thomas, J.P. (Past President), Mr. G. A. T. Iiddleton, A.R.I.B.A. (Past Vice-President).

After the Royal toasts had been musically honoured,

His Honour Judge Rentoul, in proposing "The Houses f Parliament," said he was particularly anxious not to miss heir entertainment, as he wished to give the Society of rchitects the opportunity of solving the problem of heating nd ventilating the new Old Bailey. At present he conidered it in those respects the worst he had ever been in. udge Rentoul made a humorous defence of the House of ords. Man for man, it would, he declared, compare with ny assembly of the same size on the face of the earth, whether r its distinguished statesmen, warriors, or ex-lawyers. If he House of Lords was to be changed for the better, then it ould be a remarkably good one.

The Right Hon. Lord Saye and Sele, in responding for the ouse of Lords, said he could only conclude that the reason r his being invited was that he had a son who was studying t the Architectural Association's school. Presumably, therere, the organisers had applied the principle of heredity ackwards. With regard to the toast, it seemed to him that was an example of bad building, inasmuch as the two who ere to reply for the Houses of Parliament were a Tory M.P. nd a Radical peer.

Mr. Herbert Neild, M.P., said the political events of the ast twenty-four hours had rendered his task a most difficult ne. The profession of architecture demanded that its practioners should be engaged on constructive work, whereas the oposals of the Government were solely of a destructive ature. It would be well to remember that until a comparavely recent period the House of Lords and House of Commons sed to sit together, and offer joint advice to their Sovereign. was to be sincerely hoped that they would come through this ying period in such a way as to still uphold the mother of rliaments as a model to the world.

Mr. L. A. Atherley-Jones, K.C., M.P., proposed "The ociety of Architects." He said it was to him a matter of tisfaction that the toast which it was his duty to propose d not trench upon the dangerous ground of party politics. e toast of the well-being of the Society was justly regarded the toast of the evening. He himself was present in a mewhat hybrid capacity, for in addition to being their guest was also an honorary member. He felt at the least a tain amount of regret that he had not been able to serve Society in obtaining the passing of a Bill in which they took a profound interest, and which was a reason for the gin of the Society, viz., the Bill for the Registration of chitects. He could assure them that the failure was not e to his own shortcomings, but entirely to the methods der which the Parliament of this country was conducted. r it was impossible for an unofficial member to advance a ll beyond the stage of a first reading. The Government of time, whether Liberal or Conservative, monopolises all session and prevents the advance of humble though useful asures in which such societies as their own were interested. was absolutely futile for any individual unofficial member try to make progress with a Bill which is at all of a controsial character. The Society of Architects had therefore en a wise course in suggesting that Lord Saye and Sele uld introduce that Bill into that serene assembly, which in e form or other is likely to continue to exist. It was to be hoped that if the Bill should meet the approval of that upper chamber it would enjoy a fair chance of being taken up by the Government of the day and passed into law. The Society had been founded twenty-six years ago, and never was it in a more prosperous condition than at the present time. That satisfactory state of things was in a large measure due to the fact that the Society was looked upon by architects as the machinery by which the Registration Bill will be passed into law. The proposal had been characterised as a narrow and yet not unbeneficent form of trade unionism. Well, that may play some part with the object in view; it was a desire on the part of the great body of architects to serve the interests of the general public by securing that the operations of the architect shall be carried on under conditions which shall safeguard the best interests of the public. The true architect combined technical skill with the poetry of art. Of such a character was the inspiring genius which transformed the humble cabins and hovels of a primitive age into the magnificent temples of Athens. Mr. Atherley-Jones said that it was because he cherished that ideal that he placed his services at the disposal of their great and distinguished Society. The difficulties that beset the passing of this measure appeared to have been largely due to a certain feeling of apprehension on the part of a sister body. But it was cheering to observe signs and tokens that the Royal Institute of British Architects is disposed to encourage legislation upon the lines advocated by the Society. Mr. Atherley-Jones stated his conviction that if the Society could secure the co-operation of the Institute that small but powerful influence opposing the Bill would disappear. He hoped that when they next met together they would be able to congratulate themselves upon the attainment of a work which is as much for the benefit of the general public as for the profession.

Mr. Geo. E. Bond, J.P., president, in responding, said a year ago when he last had the privilege of responding to that toast, he endeavoured to justify the position the Society had taken up with regard to the Architects' Registration Bill, and further, he was able to announce the result of a plébiscite on the question, taken by the *Builder*, which showed that out of some 2,500 replies received from practising architects in the United Kingdom there was a clear majority of eight to one in favour of registration; and that that result corresponded almost exactly with one of a similar plébiscite instituted by the Council of the Society some years previously. He did not intend going over the old ground, but Mr. Lamb, who responded for the House of Commons on that occasion, then expressed the opinion, as Mr. Atherley Jones had just done, that it was absolutely essential that architects should agree among themselves before attempting to present a Bill to Parliament, as owing to the congested state of public business it was almost impossible to carry a private Member's Bill through the House of Commons, unless all parties affected were unanimous in its favour. He (the speaker) subsequently emphasised this point, for he felt then as now, that although they were assured that a vast majority of British architects were in agreement with them on the question of registration, they could not hope to carry their Bill through if opposed by the Royal Institute, nor could that body succeed if opposed by the Society. It was therefore extremely desirable that all parties should at once agree upon the general principle of such a Bill, and he once more affirmed that the Society was not only willing, but anxious to work in harmony with the senior body in this matter. He did not suggest that the Institute should accept the Bill as it stands, but simply that it should carry its own policy to a logical conclusion; that instead of concentrating its efforts upon endeavouring to surround itself with a halo, it should attempt legislation in a broad-minded and practical spirit, in the interests not of a section only, but of the whole body of practising architects in the kingdom. Should the registration committee of the Institute, in preparing its new scheme, take advantage of its great opportunities, by including a definite proposition to apply the same qualifying tests to all future candidates for admission to the general ranks of the profession as are now applied to all candidates for admission to the Institute, it would receive the loyal support of a united profession and incidentally add greatly to its own power for good and its own prestige. The latest proposals of the Institute as to the licentiate class were humiliating.

Mr. Lamb further suggested that the time had arrived when they should decide among themselves whether architecture was an art or a profession, for if the former it should be left to its own free development, but if it was a profession it was entitled to the same protection in the form of registration as other professions. He (the speaker) ventured to suggest that at least 90 per cent. of the practising architects in this country were satisfied that it was a profession, but whether it was an art where some of the chief essentials to succeed were scientific and technical knowledge and common sense aptitude or whether it was a profession in the practice of which a knowledge of art was essential, mattered not at all to the building public, nor was the general practice of architecture affected by the question whether an individual practitioner styled himself an artist or a professional man; and he ventured to say that a definite solution of the problem would have no practical value. He was convinced that the great success of those leaders who styled themselves artists had been founded upon the fact that they were also practical men, with great business ability.

Many present, either in their private or public capacities, were interested in the employment of architects, and he asked them as practical men, whether in making a selection they were entirely influenced by a man's artistic qualifications? He felt sure they were not, for in addition to an art qualification, they required an architect upon whose strict integrity they could rely, one whose practical common sense would enable him to fully grasp their requirements, and who would carefully study the nature and routine of the business, or other work to be carried on in the building with a view to making it perfectly convenient for its purpose; one whose knowledge of construction, and of materials, would enable him to design the structure soundly and economically; and whose business knowledge would enable him to obtain reasonable tenders for the work, arrange terms of contract and carry all through to completion, protecting his client's interest with regard to ancient lights and other easements, while at the same time avoiding disputes leading to litigation with regard to the rights of adjoining owners and others. Thus, they expected their architect to be not only an artist, but a scientist, and a good man of business.

The small but select band of active "Anti-Registrationists," the members of which were their chief opponents, held that candidates cannot be satisfactorily examined in art, and that compulsory examinations would inevitably lead to stereotyped forms and a dead level of mediocrity. But the great inconsistency of this view was evidenced by the fact that most of them were staunch supporters of the Royal Institute, a body which now applied these art tests to all candidates for admission to its ranks; therefore, if their view was a correct one it would necessarily follow that the Associate members of the Institute were in danger of achieving that stereotyped mediocrity; while all those outside, being left to their own free development would have the better chance of becoming great artists, and consequently better architects, but the recognised facts stamped this assumption as perfect nonsense, for since the institution of those examinations in 1882, the standard of ability among the Associate members of the Institute had been continually rising, and at the present moment many of them were among the leading members of the profession. The Society simply desired the same principle to be applied to every candidate who wished to practice as an architect, and he thought they had reasonable grounds for inquiring why examinations which were necessary to the maintenance of the Institute's status could have other than a good effect when applied to the whole profession?

All sections were in absolute agreement with regard to the nature of the technical and practical qualifications required in the practice of architecture, differences of opinion being confined to the art side of the question, and with all due respect to their art leaders, he ventured to suggest that the rudimentary principles upon which the art was founded, its grammar and its history, must be taught, and that up to this point most architects in embryo would be the better for having received such teaching, and none will be harmed thereby. Its result might safely be put to the test of a compulsory examination; beyond this he agreed that it ought to be left to its own free development.

He suggested that without loss of dignity they might break through the veil of false sentiment which now obscures the general body of practitioners, step down among them, and look at the question from the point of view of the average provincial architect. From that side they would be able to see the tangled strands of inconsistencies with which that veil had been so closely woven, and to recognise the strength and earnestness of the registration movement, and that a large majority of their brethren had decided after mature consideration to persevere in their endeavours to carry through a broad-minded scheme of universal registration, involving a more thorough system of education and compulsory examination for all. He contended that modern conditions of practice demanded legislation on modern lines. Why should the modern false quantity of art sentiment be allowed to block practical progress? There was no absolute agreement among art leaders upon the principles which had determined the evolution of architectural art.

All thoughtful observers must acknowledge that the architecture of to-day, with its affectations, individual eccentricities and random impulses, reflected very fairly the mental conditions in which they lived. But some of the great teachers and lecturers, men recognised for learning and ability throughout the profession, condemned this view; one told them to "leave all such notions to the industry of German speculation." They agreed in tracing the evolution of styles to either the influence of the materials at command, or to structural requirements and necessities, and in sweeping away all theories which connected human emotions with architecture. Their immediate predecessors, the teachers of a past generation, emmeshed the art in a perfect network of definite rules and regulations which had their influence still; here were conflicting views taugh to-day, neither were correct as it stood, but by combining th two they might arrive at the truth with regard to architectura art, an art which was the outcome of centuries.

Were an art qualification the only requirement in th practice of architecture, he would say leave it to its own fre development; for in the past all art teaching had been to dogmatic. As previously suggested one might with advantag teach its principles, history and grammar, but its highe forms could only be inculcated as a spirit, and not taught a a creed. There was in every art a gradual evolution from crude simplicity to more complex forms, and without doubt educated sensibility would derive pleasures more elevated an refined from the more elaborated forms. There was, however a limit beyond which such elaboration must not pass, or would have a reverse effect; this was particularly true wit regard to the art of architecture, all examples of which we judged by some definite standard of taste.

During the last fifty or sixty years, standards of taste i architecture had been almost as numerous and as ephemer as those in the art of millinery. In his Romanes lecture Oxford on "Questionings in Criticism and Beauty," M Balfour said, "The history of taste yields no positive result as all our great critics have been engaged in sweeping aw the rubbish of their critical predecessors." This being t case, he thought it unwise to dogmatise, for every age wou fit its own standard; in the past, the master genius had s some particular fashion, and his disciples had followed i dictates with more or less fidelity; and as modern conditio did not conduce to the individual practice of clear and origin thinking, this state would obtain in the future. Therefo as the modern practice of architecture involved scientific a technical knowledge and business ability as well as artist taste, it was obvious that no artist without practical kno ledge could be an architect, and they desired to establish definite minimum of these combined qualifications below whi in the future no man should be entitled to style himself as architect. Such a minimum would not check advance in a of the branches; the master mind would still rise ab dogmatic limitations, for true architectural genius could be confined within a ring fence of rules and regulations, would be continually inspired to break forth and evolve n combinations of those beautiful lines, beautiful forms a beautiful colours which were the basis of the art and wh were constant in the effect which they produced upon cultured intellect.

At the conclusion a presentation of the Society's g medal, and a silver tea and coffee service, was made to Mr. E Marsland, past honorary secretary, by Mr. Bond, who s that Mr. Marsland had rendered such long and faithful serv that the Council decided to present him with some tangi token of their regard. It was at once determined that individual subscriptions should be limited to an extrem low amount, so that they should be thoroughly representat As a consequence subscriptions had come in from every p of the Empire. Mr. Marsland had always remained tru the interests of the Society, and had been one of the champions of registration. At his own expense he attended conferences held in large centres in order to expl the aims and objects of the movement; and in some cases succeeded in turning organised opposition into active supp Thanks to such efforts the success of this object of the Soc was now in view. All that is wanted is one strong persona with courage to step into the breach and apply balm to sore spots caused by twenty-five years of struggling. recent plébiscite showed the general body of the profes were waiting for some such lead. It was to be hoped that a person would step forward.

Mr. **Ellis Marsland** said in the first place he wante thank everyone for the honour done in presenting him the gold medal—the highest honour which the Societ rchitects could confer. He also wished to express thanks or the splendid testimonial. Mr. Marsland said that he ould flatter himself that some years ago he had been of ervice in promoting the registration of architects. The priniples of the movement were in the first place received with ndifference, and even with ridicule and contempt. The stage f indifference became one of reflection, and ultimately one f recognition, until at the present time a large majority were n favour of those principles. The only point was how to arry them out. It would be unwise to even suggest what ould be the best method ; but there certainly would be found ome way out of the difficulty, and in the meantime they must ait and see. The post of honorary secretary to the Society as a responsible one, and should not be occupied too long by ny one individual. When an opportunity to quit it had risen some time ago, he made up his mind to leave to a ounger and more able man to continue the good work of the ociety. His work as honorary secretary had enabled him o visit towns in England and on the Continent, to see things nd to make friends, all of which he probably would not have one under ordinary circumstances. The medal and the andsome testimonial would ever remind him of the pleasant ime he had had and the large number of friends he had made, any of whom were present that evening.

Mr. Henry Tanner, jun., F.R.I.B.A., proposed "The ocal Authorities," and paid a tribute to their unfailing ourtesy under trying circumstances. The regulations they ad to administer were framed for the good of the greatest umber, and in consequence the few might have to suffer ccasionally. Their duties ranged from the London Building ct to the examination of milk, and the removal of banana kins from the pavement. Mr. Tanner commented on the naccuracy conveyed by Mr. Bond when he suggested that he members of the Royal Institute were not practical men. his was not the case.

Mr. Cyril Cobb, vice-chairman of the London County ouncil, in responding, expressed his thanks for the kind emarks made about the London County Council, especially as any things in the regulations must be galling to architects. e sometimes wondered whether there might not be some body xercising jurisdiction over the buildings about to be erected. he Council itself had already enough to do without being hat body. He suggested that at least one of the London ounty Council buildings which stood very near them, viz., e Day Training College in Southampton Row, fulfilled the equirements of what a public building should be. With egard to their educational work he would like to say that the ouncil took a very great deal of care in the instruction of the oung people, and endeavoured to render it of a practical aracter. They hoped by laying a foundation of sound views turn out the boys as really good craftsmen.

Alderman Max Clarke, F.R.I.B.A., Mayor of Holborn, ho also responded, made a brief defence of the new Old ailey, a building which had been designed by a really great an who had done his best. It was part of the unfortunate osition of architects that they incur faults which they have power to stop as the work is going on, or even to express an inion whether it would be a success or not. It was the eaker's unlucky privilege to attend the Kennington Sessions, d he was convinced that that old building was fifty times rse than the new Old Bailey. There were admittedly two bjects about which most architects in this country or any her knew nothing, viz., acoustics and ventilation. The ole was a series of experiments. If the results are unsucssful, then the architect is blamed ; if the experiment is oderately successful the architect is never congratulated. the Council of the Royal Institute they were doing exactly e same with regard to registration as was being done with gard to acoustics and ventilation ; that is to say, they were ing their best. The Bill that was being promoted would obably be treated in the same way as the public treat archits. But so long as a beginning was made, that was the thin ge of the wedge. It would be a great advantage if the archits in the Kingdom would state their views in black and ite, for it seemed as if several people say they are registranists, and then when the time comes they do not act upon it. ch people try to run with the hare and hunt with the unds. Mr. Max Clarke said he begged to differ slightly from President's remarks as to the antagonism existing between two societies.

The toast of "Our Visitors" was proposed by Colonel S. Leslie, R.E., hon. secretary, and responded to by Mr. nest H. Lamb, C.M.G., Mr. H. D. Searles-Wood, R.I.B.A., chairman of the Royal Sanitary Institute, and . Frederick Higgs, president of the Institute of Builders.

## THE ARCHITECTURAL ASSOCIATION.

"Arctia."

"Arctia," a musical play in two acts, written by Mr. Gervase Bailey, and composed by Mr. Leonard Butler, was rendered by the Association on Monday and Tuesday evenings last at the Royal Court Theatre. The scene is laid on the terrace of the Royal Palace of Arctia, and though within view of snow-capped hills, "where the wild winds rage and the tempests blow," the assembled court, judged by their costumes, appear indifferent to the chilly air.

Into this legend of the Far North an architect intrudes. He has built temples by the score and of town halls even more, but not content with so much success this effete old monopolist plans castles in the air ; but we anticipate the story. King Rudolph of Arctia has some ambitions and an only daughter, the last of the royal race of Icebergs, whom he is ready to sacrifice as a hostage to fame. He would have us believe that his purpose is to test the love of suitors for the Princess's hand, and he stipulates they must undertake the small task of discovering the Pole. The Princess is agreeable to abide by these conditions for her Queen Mother favours the suit of Vinolia, architect-in-chief (Mr. G. B. Carvill). Had Vinolia wooed with such sentiments as "if I built a world for thee," the maiden perhaps would have listened even to such an old man, but instead he reveals a despotic nature.

You may talk of architects,
And their merits and defects,
Of their powers of construction and design ;
But such trifles do not matter,
You ignore them and grow fatter
In a little State monopoly like mine.
If a tower should collapse
Then you hang the builder chaps,
While exhibiting a little decent grief ;
If a town hall look unsightly
You behead your staff politely—
It's your duty as the Architect-in-Chief.

If this jackdaw mates with the linnet we shall be grieved, but No ! a wondrous happy surprise excites us. The keeper of the seals hurriedly approaches the king and reports a strange phenomenon in the sky. Is it a comet, a shooting star, a flying pig, a blue moon ? No ! a thing never imagined. Out of the dim distance, across the walls of snow, an airship approaches. It sails past the terrace and discloses to view the daring occupants, strangers of an unknown clime. In aviation we are evidently only regaining a lost science, 'tis perhaps as old as life in Mars ; the play would have us believe so, for instead of the hairy goggled bogies we associate with flying machines, these adventurers are Vikings, and prove to be Count Ripolin, flashing like a meteor, of the Viking Exploring Expedition ; Sigurd, a Viking chieftain ; and a small band of chosen men. Time and petrol may be precious for these warriors speedily acquaint the court with their mission.

The Princess and Sigurd happily meet, he divines her fate, and resolves to gain her. She gives him a magic wand, on which is inscribed the legend that it will stand upright on the spot where the pole is. Vikings we always believed were fierce men, but this Sigurd is a modest youth. Perhaps a trip in an airship cools one's ardour, and we could see from the first that Princess Hilda was ready to meet the tender youth half way, and she beguiled us all with her plaintive notes.

The King and his Prime Minister, Sapolio (Mr. H. M. Whitehead), discuss affairs of State, which very properly give the versatile and excellent Sapolio an excuse for song and dance.

On the summit of a spire sat a little weather-cock,
Cock-cock-cock-a-doodle-do.
He was specially designed, not a specimen from stock,
Hey, but my tale is true.
He'd a golden comb and wattle and a little golden mane,
And his tail blew out behind him in a shower of golden rain ;
He was quite the little weather-cock, and not a little "vane,"
With a cock, cock-a-doodle-doo.

So he turned to the East,
Though he liked it least,
And he turned to the West,
For he liked it best ;
When it roared from the North
He would turn in his wrath ;
When it sighed from the South
He would open wide his mouth
In a long cock-a-doodle-doo.

*Chorus.* With a cock, cock, cock-a-doodle-doo, etc.

And all the people said, "What a trusty little bird
Is our cock-cock-cock-a-doodle-doo.
The way he shows the wind that blows is really too absurd,
Hey, but his tail is true."
But the winds they didn't like it and were mightily put out,
For he showed them all in turn how each one was put to rout,
So one day they all came whirling in a mighty water-spout
On that poor little cock-a-doodle-doo.

Then the wind from the East
Behaved like a beast,
And the wind from the West
Hit him hard in the chest;
And the wind from the North
Belaboured him in wrath,
While the wind from the South
Smote him full in the mouth,
And stopped his cock-a-doodle-doo.

*Chorus.* Oh, cock, cock, cock-a-doodle-doo, etc.

Then the wretched little fellow didn't know which way to go,
Cock-cock-cock-a-doodle-doo.
And he spun upon his axis till he reeled with vertigo,
Hey, it is sad but true.
And soon his bearings got so hot they jammed and he stuck fast,
Till a mighty wind came buffeting and snapped him off the mast,
And he fell among the pinnacles expiring with a last
Long cock-cock-cock-a-doodle-doo.

It may blow from the East,
But he heeds not the least;
It may blow from the West,
But it breaks not his rest;
It may blow from the North,
It will never raise his wrath;
It may blow from the South,
But he'll never ope' his mouth
In another cock-a-doodle-doo.

*Chorus.* In a cock, cock, cock-a-doodle-doo, etc.

The Queen and her *protégé* resolve to spoil Sigurd's chance, and the scheming pair draw attention to an old law which enacts that all strangers setting foot upon the soil of Arctia shall pay for their audacity with death. The King and his minister Sapolio are not to be baulked in their endeavour to claim the Pole within the realm. His Majesty announces an amendment which rescinds this extreme sentence if the stranger can discover the Pole within the year. Sigurd, with all the confidence of youth, departs to find the Polar axis with the icebergs spinning round.

ACT II.—A year has elapsed. 'Tis the merry month of May, and Princess Hilda is disconsolate. Sigurd has not been heard of and preparations are made for the wedding of the Princess to Vinolia. The latter would claim our goodwill and attempts to exhibit youthful elation.

A was an Architect, old in his prime.
Pity the architect.
B was a Builder who took his own time.
Pity the architect.
C was a Client who had his own views,
D was the Details that no one would use,
E the Erection he tried to excuse.
Oh, pity the architect.

*Chorus.* Oh, pity the architect,
Why on earth did he ever select
Such a silly profession?
Then hear his confession,
And pity the architect.

F was the Frontage exceedingly tight.
Pity the architect.
G was the Ground Plan exceeding the site.
Pity the architect.
H the Half-timber he had to reveal,
I was the Ironwork he had to conceal,
J was the joinery, mostly of deal.
Oh, pity the architect.
Oh, pity the architect, etc.

K was the King-post that ought to have stood.
Pity the architect.
L the stone Lintel that proved to be wood.
Pity the architect.
M was the Mullion that blocked out the light,
N was the newel too thin for its height,
O the oak sill that was not water-tight.
Oh, pity the architect.
Oh, pity the architect, etc.
P was the Price on the contract agreed.
Pity the architect.
Q was the Quantities down to a bead.
Pity the architect.
R was the Rage that the client displayed,
And S the Sarcastic remarks that he made,
When T was the total that had to be paid.
Oh, pity the architect.
Oh, pity the architect, etc.

U was the Umpire called in to decide.
Pity the architect.
V was the Value the client denied.
Pity the architect.
W stands for Words that he said,
X was the Xtras for which he was bled,
Y Z the Young Zealot who wished he was dead.
Oh, pity the architect.
Oh, pity the architect, etc.

Count Ripolin (Mr. A. W. Bentham), desperate and loyal to his absent adventurous chieftain, plays to gain time, and in song and dance terrorises King, Queen and Count by narrating the fiendish diversions of Vikings. King Rudolph and Ripolin must be acting in collusion for his Majesty has a song up his sleeve. Perhaps he had received a wireles from Sigurd, for he tells of a good time coming.

Then no silly little worries will distract the Architect,
He'll be master of his soul and fancy-free;
He will simply be the Artist (with a most emphatic A)
And Designer (with a more emphatic D).
He will sit before his canvas with his baccy, pipe and pot,
And await the inspiration that will either come or not;
Then he'll seize a chunk of charcoal and will dash it in red-hot
In the Golden Age to be.

In the Golden Age, in the Golden Age,
There will be no angry clients to assuage;
There'll be no specification,
No Plans or Elevation,
No girder calculation,
And no Extras arbitration,
In that great and Golden Age.

At this point Sigurd appears, having failed to discover th Pole. Finding the city and palace decorated, he realises tha preparations are being made for the wedding of Prince Hilda. He conveniently faints on the terrace, thus allowin Hilda to hurriedly approach him. She proposes to elop with him in the airship. Vinolia overhears the plot, cu the cover of the airship, and has Sigurd made prisone Before the King, Queen, and Court, Sigurd admits h failure. He demonstrates how he sought to discover the po by means of the magic rod, and hazarding a throw, to th astonishment of all it stands alone and upright upon th very polar axis the King has built his palace. His anxiety at an end. Sigurd weds Princess Hilda, and realises th dream of his life. Vinolia, sharing the common fate of arch tects, does not, and the lesson we learn is that though may soon be able to fly, we must never dwell long in castl in the air.

Mr. Butler and Mr. Bailey are to be congratulated on th revival of their clever and tuneful production, and to th company of players we offer our compliments and thanks f an evening's entertainment.

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| RUDOLPH, King of Arctia ... | F. DARE CLAPHAM. |
| QUEEN OF ARCTIA ... ... | MRS. G. B. CARVILL. |
| THE PRINCESS HILDA, their daughter ... ... ... | MISS WINIFRED DAVIS. |
| VINOLIA, Architect-in-Chief ... | G. B. CARVILL. |
| SAPOLIO, the Prime Minister ... | H. M. WHITEHEAD. |
| COUNT RIPOLIN, of the Viking Exploring Expedition ... | A. W. BENTHAM. |
| SIGURD, Son of Sea-Wolf, a Viking Chieftain ... ... | C. WONTNER SMITH. |
| MASTER OF THE HORSE ... ... | W. OSCAR LANGBEIN, Jr |
| KEEPER OF THE SEALS ... ... | ALEC. SMITHERS. |
| MISTRESS OF THE ROBES ... | MISS MAY FARNELL. |
| LADY OF THE BEDCHAMBER ... | MISS DOROTHY FOSTER. |

CHORUS:

LADIES-IN-WAITING: Frances Bewsher, Helen Bewsher, Ed Burn, Jessie Carvill, Nellie Carvill, Dorothy Davis, Marga Davis, Beatrice Farnell, Nora Lindsay Field, Margery Fost Mildred Irwin, Dorothy Stevens.

COURTIERS: Gervase Bailey, H. E. Breach, Douglas Da H. Newnham, F. W. Walker, F. Caupers.

VIKINGS: R. C. C. Buss, T. O. Foster, H. V. Godfrey, H. Harrington, W. Paul, R. G. E. Whitney.

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MR. R. W. SMITH, of South Dene, Filey, is going undertake next autumn the erection of a ferro-concrete s wall from Primrose Valley towards the Flat Cliffs, to strain the constant slipping away of the cliffs on his L Whinns Estate. This important work will represent most extensive private effort yet made to combat sea eros on the Yorkshire coast. It forms part of a larger sche having for its object the building of a garden township villa residences on the Primrose Valley cliff-tops. C siderable strides have already been made in this work an artificial lake, having an area of some three acres, been formed.

## WATER SUPPLY ARRANGEMENTS FOR FIRE PROTECTION.

By F. J. Warden-Stevens, M.I.M.E., A.M.I.E.E.

THESE brief notes are intended to apply more particularly to large buildings such as factories, institutions, warehouses, estates, &c., in which cases it is very necessary that arrangements are available for protection against fire and to avoid being solely dependent on outside assistance of the public fire brigade.

It is proposed to refer specially to modern arrangements to ensure a proper water supply at various positions about the buildings, with facilities to enable such supply to be used at the outset in the event of fire occurring, as no doubt the question of the water supply is the most important one in connection with an outbreak of fire.

The conditions frequently existing with regard to the water supply in a large building are that a tank or tanks are fixed in the roof, these tanks being supplied by rising mains connected to the supply main. In the event of there being a staff fire organisation, hose cupboards may be available, with standpipes, or there may probably be a pail system, or emergency hand-pump appliances. Speaking generally, however, the proper arrangements of the water supply for use in case of fire are not sufficiently looked after in view of quantity, pressure, and facilities, and the following may be stated as modern conditions:--

There should preferably be a special main to which hydrants should be connected both outside as well as inside the building in important positions and on every staircase and every floor, and hoses should be left connected to these hydrants. This fire main should be in the form of a circuit with double ways for the water and with sectional valves, to enable any section to be disconnected in the event of a burst. The branch circuits from this main to the various sections of the building should also be controlled by valves to avoid obstacles to the main flow or reduction of pressure in the event of any branch circuit being rendered useless. This fire main should be connected to the high-pressure supply, and this connection should be near to the entrance, where the public fire brigade can connect their engine without difficulty. In addition, a fire pump should be provided and connected to the main at the same position.

Care should be taken in the selection of the pump to provide for air vessels of large size, as well as suction and delivery pipes of ample capacity, and to ensure free flow of water with a minimum of friction. It should preferably be of the duplex direct-acting type, and should be capable of "boosting" the supply pressure to secure a good pressure of water well above the highest parts of the buildings. This pump should be worked by power, and should be available for use at a minute's notice. In the event of a steam supply not being available in the buildings for other purposes, an electrically driven or oil- or gas-engine driven pump may be adopted. Failing either of these, a manual fire pump must e resorted to, although for large buildings power can generally be arranged.

A storage tank of large capacity and elevated is advisable, which should be kept full and solely for use in the event of ire, to be brought into use at the outset. If there is difficulty n obtaining a sufficient elevation, a pressure storage tank at round level can be adopted, the pressure being maintained by an air compressor. The general water supply system may be so arranged that the storage from the ordinary supply anks may also be used.

It is most necessary that particular attention be given to he pipe fittings, valves, joints, and connections, to ensure gainst bursts or leaks due to the increased pressure necessary in the case of fire.

A hose of useful size, 2½ or 3 inches, requires a pressure of bout 40 lbs. at the nozzle for a one-inch jet to reach a height f 75 feet, but it must be remembered that the loss of pressure in the hose is considerable and that the pressure in the main alls when several hydrants are in use, so that a high water ressure must be maintained, say about 60 lbs. A first-class type and quality of hoses are necessary to withstand the pres-ure, as upon this depends the satisfactory use of the water upply available. A good rubber-lined seamless canvas hose a suitable type and will withstand a high pressure.

As to the quantity of water necessary to maintain the fire upply, it may be allowed that each jet of water requires bout 100 to 200 gallons of water per minute, depending upon he size of jet and height to be delivered, so that a very con-derable quantity may be required.

Prevention of freezing of the water in circuits only used in case of fire can be secured by allowing a slight flow of water to cause circulation in cold weather.

As a first aid, reference to the use of water-buckets kept in convenient positions, and also emergency hand-pumps with tanks self-contained, must not be omitted. It must, however, be ascertained by periodical inspection that these are not allowed to be left without water or to be used for other purposes, thus rendering them useless in time of need. It is to be noted that a thin film of glycerine on the surface of the water in these buckets and tanks will reduce evaporation. Periodical inspection is also very necessary to ascertain that the pump is in proper working order, and the main, hoses, connections, and fittings watertight.

Having now referred to arrangements to ensure a satisfactory water supply being available and facilities for using it at various positions throughout the buildings, mention should be made of arrangements for automatic distribution of the water in isolated portions of the buildings or in parts not coming under frequent observation. In such cases, automatic water sprinklers may be frequently adopted with advantage. These consist of sprays or jets attached to water-pipes distributed and fixed on the surface of the ceiling. These jets are kept closed by fusible metal caps and only released by collapse of the covers when the temperature becomes abnormal.

In concluding these notes it may not be out of place to refer to the notification of fire to bring the available water supply into use. The alarm system frequently adopted is that of electric contacts enclosed in glass-fronted cases. These contacts operate a central indicator and gong, and the alarm may be augmented from the central indicator by the operation of a steam whistle and gongs in various important positions about the buildings. For night watching an automatic check or telltale system is usually adopted.

These arrangements, in conjunction with a complete telephone system, can ensure prompt action without panic, as, on an alarm being given from a certain position on the premises to the central position, the telephone system enables the circumstances to be ascertained and immediate notification given in some or all quarters, as may be necessary, either by telephone or alarm, or both, as occasion may require; after an alarm, the operation being to make use of the fire buckets and hand-pump in the particular location of the fire, and, if the conflagration justifies, to run out the hose from the nearest hydrant; then for the fire pump to be started, and, if circumstances should necessitate, a telephone message to the public brigade.

It is to be hoped that these brief notes will act as a reminder of the importance of this question, which, it is to be feared, is apt to receive insufficient consideration, notwithstanding the disastrous fires which only too frequently occur. It must also be remembered that insurance against loss by fire does not minimise loss of life, or the great inconveniences that are caused by fire, or even that the full financial loss is recovered.

First aid in the case of fire is of the utmost importance, and proper appliances are useless without a water supply at a high pressure in sufficient quantity and at various positions.

## AN ARCHITECTURAL WALK FROM WESTMINSTER TO CHARING CROSS.

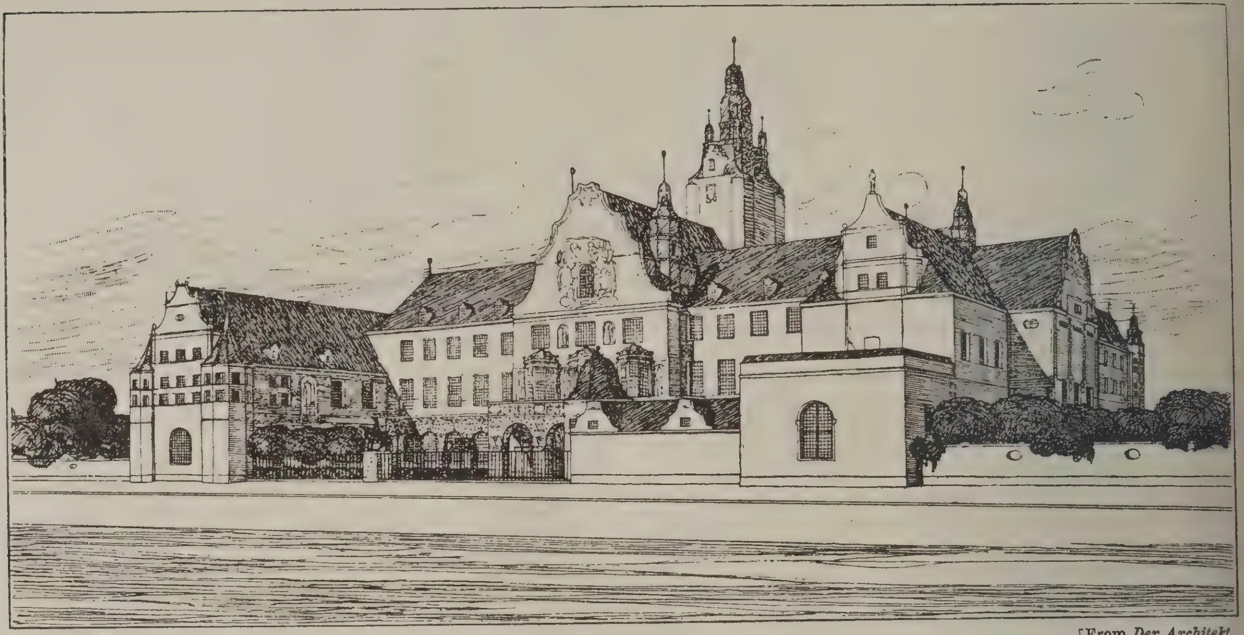
By Percy Fitzgerald, M.A.

WE could imagine a pair of thoughtful, enquiring architects wandering from Parliament Square, Westminster, to Charing Cross, criticising and discussing as they walked all that they saw on the road. Much might be learned and much seen that was unsuspected. For on this route are crowded works of architects of all sorts and conditions. Here is the great Inigo, Robert Adam, even greater in his line, Sir Charles Barry, Nash—the French school even, Pugin, Brydon, Young, and others. Here is Gothic, Palladian, Early English, French, Georgian, Late Victorian. And here are contrasted many styles, with many striking things and some mistakes. If the reader will follow me on this promenade I will show him things that he may never have thought of observing.

The architect of to-day must look with surprise or amazement on the attempt to fashion Westminster Hall and the new Houses of Parliament into one building. As they are of different styles, of different alignment, and are antagonistic in every way, the task seemed impossible. But it was rashly attempted, and the Hall was encrusted on to the outer shell of the new Palace. The old fabric now lies embedded as it were in the vast bulk of building that has grown up about it. Seen on the ground plan, it lies a distorted rhomboid in the middle of the fair regular lines of the newer Senate House. And what a difficult problem it was—the Palace was to follow

## MODERN EUROPEAN ARCHITECTURE.

### AUSTRIA.



[From *Der Architekt.*

DESIGN FOR A MUSEUM AT INNSBRUCK.—Herr Heinrich Ried, Architect.

the line of the river on the one side, while on the other it had to join on to the old Hall which was all "askew." At the extremity a sort of gable or wing from Barry's Palace projected, and the two buildings mixed up together were made to join after a fashion. The contrast of the two roofs, each of a different angle and height, the vast expanse of the older one contrasted with the attenuated coverings of the new is strange indeed. The whole effect of the composition is bewildering. What was to be done? it may be asked; the attempt had to be made. The real question is *que diable fait-il?* &c. Why think at all of blending the old and the new together in this fashion? The thing was literally impossible. Yet for more than half a century no one could make up his mind as to what could be done. We may lament all this falling away when we think how noble would have been the effect had the square been completed and the Gothic buildings been carried right on to join the other portions. What a Palace! How broad and solid! Now it seems but a thin unsupported strip carried along the river side. What have we not lost by this inconstancy and hesitation of treatment? We ought to see now before us a noble block of substantial buildings starting from the bridge and tower—a long stretch of Gothic work—the corners taken off to form a great gateway of entrance, the building carried on and turned a right angle, another long stretch, with its Gothic pinnacles and rows of Perpendicular windows, completely enclosing Westminster Hall. It would then join the existing portion, where the equestrian king stands—or rides. Entering by a great archway, we should have found ourselves in a great courtyard—Gothic all round—the front of the Hall removed, for it was a comparatively modern restoration, and something more harmonious substituted.

Within Westminster Hall there is palpable evidence of the attempt to join these incompatible things together. First the upper end was knocked out altogether, a flight of steps being introduced which led up to quite another level leading away on the left to the Parliament lobbies. What was the effect of this vandalism? The noble old Hall was on the instant transformed into a passage. And a passage or corridor to the Parliament House it has remained ever since. A further beautiful window is seen beyond, "Perpendicular" in style; but here the levels did not allow of its crest falling below the oaken roof of the Hall, which cuts across it. To cure this blemish Barry intended raising the whole roof by hydraulic screws, thus adding to the height of the walls, which would have destroyed the proportions.

Sir C. Barry always has the credit of this great work, and a real architectural success it is. But those who have studied Pugin's style and principles can recognise his elegant touch in every direction. All the ornamentation is admittedly his, and one might certainly credit him with the beautiful *flèche*, worthy of St. Ouen. *Apropos*, how amazing that the Canons of Westminster, who look so carefully after repairs and renewals, should never have thought of restoring their old spire, for which the base is ready waiting. It would be both cheap and easy, were it made of timber covered with lead or copper; and what an improvement to the old fane. I recall when the Houses of Parliament were in a perpetual state of decay and renewal. There was always a long row of scaffoldings up at some portion or other while this work went on. Now the destruction seems to have been arrested.

Nowadays we can hardly realise the barbarity of sending recalcitrant M.P.s to the Clock Tower for imprisonment. This was done within our own memory. Imagine the horrors of having "Big Ben" all but at your ear! Sleep must hav been out of the question, but madness very much in question. Another barbarity was that of making the poor clock-winde ascend some hundred of steps every day for his duty. Now, we believe, there is a lift. It is curious how a simple thing wil destroy all æsthetical association. For this clock-face see from afar had suggestive, even poetical, associations. But i has been converted into a sort of giant lamp post or lighthouse and when Parliament sits a great flaring lamp blazes from it summit to tell far away members that the House is sitting o "up."

It may have been noticed that the great Victoria Towe seems too short and too thick for its bulk and lacks proportio in reference to the far-spreading building below it. Th truth is Barry for years was projecting it skywards, until a last Parliament interposed with a peremptory order to sto and to put the cap or crown on. This he had to do. I reca this autocratic interference perfectly. It is quite clear tha some later "hand"—was it Edward Barry?—added th arcade below the Clock Tower in Palace Yard, which is dis cordant with the fabric, not only in style but in the materia for it seems made of a white Portland stone, whereas th fabric is of a yellow tint. The "grille" and its supportin piers are equally uncongenial, and seem to belong to anothe era. Pugin would have revelled in the task.

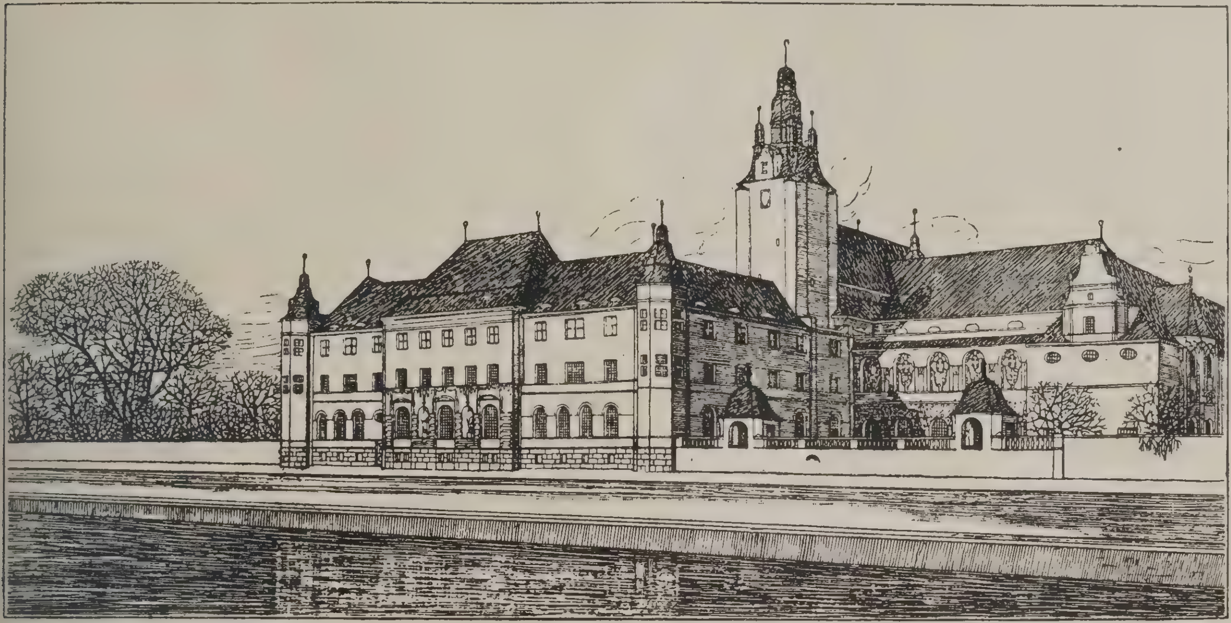
The Clock Tower is an elegant and original structure, bu we see it now as it was never intended to be seen—that is as detached tower. I remember when the whole side down to th ground that turns towards the Abbey was all exposed, with i inner bricks, &c., waiting for the building that was to attached to it. The Clock Tower would thus have risen out the building of which its lower half would have formed corner. I remember how the workmen were set to work cover it with carvings, &c., setting up an arcade in front, an an enclosure round Palace Yard.

The head or dial was long a great difficulty, and sever experiments were made, the Prince Consort making sugge tions. It must be said the arrangement is cleverly and grac fully managed. At the time of the fatal addition that w added on to it, an alternate scheme was to build on a continu tion of the main building so as to completely shut it in.

The great Gothic entrance to the Victoria Tower was on a subject of keen discussion, the point being whether t opening should be carried up for two storeys as it is now,

## MODERN EUROPEAN ARCHITECTURE.

### AUSTRIA.



[From *Der Architekt*

DESIGN FOR A MUSEUM AT INNSBRUCK.—Herr HEINRICH RIED, Architect.

for one. It is said that the former course is out of proportion and has dwarfed the structure by creating a false scale.

It is difficult to exhaust all the artistic mistakes that have been made in this quarter—notably that of putting the great Oliver in a sort of bear pit. Were he placed on a common pedestal we should have had to look down on him; so double pedestals, one on top of the other, were contrived to raise him to the level of the street. This wanton treatment of one of our greatest men, as though we wished to hide him away as much as possible—which actually was the case at the time—was unworthy.

The imposing Place de la Concorde in Paris occurs to us as we gaze on the somewhat rude disposition of Parliament Square for which art and nature have done nothing save "uglifying." The grass plot, with its meagre flower beds, has been divided into two by a walk, and each plot has been enclosed by a railing of true ironmonger pattern. The disposition of the four statues is terribly symmetrical. What a gain were it if the whole ground was laid out in asphalte as a public *Place*, the grass plot where Canning's fine statue stands being included. The equestrian statue of Edward I., now so awkwardly placed on its very low pedestal beneath the shadow of the House of Lords, might be set up in the centre, and the four statesmen in frock coats dotted about here and there. There might be rich ornamental lamps of large proportion. All this would be very imposing, and there would be an air of space and animation from the quantity of vehicles crossing and recrossing. But who would have the courage to make this vast change? Yet the great and important mass of buildings surrounding it clamour for space unencumbered, and would be seen to far greater advantage. If the Abbey enclosure could be thrown in, how fine would be the effect! But that is hopeless. Sir Gilbert Scott's building at the entrance of Dean's Yard is successful enough and harmonises well with the Abbey.

Here is the good old robust type of church, St. Margaret's, not at all disagreeable to look at, though rude enough in treatment. But what could have prompted them to stick on, as with paste, that extra Gothic portico, with its pinnacles, crockets, &c., and all, as Elia said of the "Anatomy of Melancholy," in a modern dress—so "heartless"? There, however, it has stood, I suppose, for twenty years. I fancy they intended treating the whole church in the same way. But the incongruity seems unpleasant.

Have we lost the art of expressing the finer abstract qualities in stone, such as stateliness, nobility, dignity? We may note a falling off in these things during the past years. Witness the case of doorways and gateways. In all these new public offices the entrances are poorish and undignified—at least not worthy of a vast building such as the Colonial Office, where a modest door leads to hundreds of passages and rooms. Now Sir G. Scott's Foreign Office has a singularly stately entrance, quite worthy of the huge palace that stretches back to the Park.

We look with some astonishment at the rich adornments of this palace, covered as it is with columns and statues and carvings, and wonder how the officials could have reconciled themselves to such extravagance. Hardly a foot of it is uncovered by decoration. Lofty are the windows, with plenty of space on either side. In those days nothing was spared. At the close, however, an unmeaning economy prevailed, and for some fifty years the corners have been left bare, and without their completing towers. How much these would add to the attraction of Parliament Street may be conceived. The jagged edges look very rude and unkempt. How spacious and stately are the great courts within. No stint of room. In the modern buildings, where room has become precious, the courts are attenuated and starved.

As we go up Parliament Street we may note two specimens of the *modern* arch—one on each side. One connects the two blocks of Mr. Norman Shaw's well-known and much admired work, the Police Offices; the other, on the opposite side, links two public offices together, is rather monumental in character and richly sculptured. But it offers the disturbing reflection that it is not intended as a place of entrance to an enclosure, but is entirely devoted to being a passage of communication *over* the archway, as we can trace by the outer surface and a too significant skylight. Thus is destroyed the whole nobility of an arch proper, or introducing the utilitarian element that always mean association of the "double debt to pay" contrived to get double work out of the same thing. The most notable specimen of which is to be seen within St. Paul's Cathedral, where Wren's broad, imposing cornices resting on pilasters are converted into a convenient walk and furnished with a richly gilt railing to emphasise it. Amazing! These communicating passages are really not arches at all, but bridges, a specimen of which is that elegant work of Robert Adam in the Adelphi, where two blocks are joined. The effect of the sculptured arch is, however, enfeebled by a petty cause. The footpath is so laid out as to enclose the base of each of the piers, following a very ugly curve. This weakens the solid aspect of the work. The two piers should spring straight out of the roadway, while the footpath should be limited to the two smaller arches.

The Treasury is a pleasing building, floridly treated, and decorative in character. But who thinks that it was originally an old red brick mansion, with rows of long windows, taken in hand by Barry and stone-faced in architectural style? It is cleverly done, and no one would suspect the change. The Treasury represents a florid style which was in high vogue say sixty years since, that is, is of rich cornices and fluted columns. Barry used it for his country houses, &c. There is a reflection of it in Lord Ellesmere's house close by St. James's Palace. In those days, circa 1840-50, everyone "swore by" Sir Charles Barry.

The Foreign and India Offices are a very successful work, and almost always impress the ordinary "passenger." There is something almost palatial about them. They suffer, however, that torturing process of "broken back" alignment now getting so common. Its success was owing to—or perhaps in spite of—a sort of "happy go lucky" arrangement between Scott, the architect, and Lord Palmerston. The original design was pure Gothic, all pinnacles and lancet windows. When the foundation had been got in, so the story runs, it was shown to Lord Palmerston, who summarily rejected it on the ground that it was too dark for the clerks to write in. He demanded an Italian design, which the complacent Scott supplied and fitted to the foundations. The architect, it was said, had never attempted an Italian design before, but no one could consider it a failure. The rejected design is said to be that of the great Midland Hotel at King's Cross, a fine, imposing structure. Few even of the architects may have noticed that the walls and towers are sloped inwards as they ascend, and that each storey recedes beyond the one below it. The same thing will be found in the new Ritz Hotel, the work of a Frenchman, and may account for its tone of refinement.

There is an old Georgian house next to the United Service Institution which offers a certain charm for anyone of true taste. It is the work of the Adam Brothers, now fast disappearing from London. In the centre is a truly pleasing, even elegant little composition, a group of arched windows on the first floor resting on the doorway below, both united. But violent hands have been laid on the latter, some of the columns carried away, the top unmeaningly altered, and the flat pediment resting on double columns shaped into a curve.

The detached building just completed beside the War Office was originally adorned with the old-fashioned decoration of four vases, which lent a certain piquancy. It occurred to the authorities that these either suggested something bizarre or were too ponderous for the façade, so they were removed. They forgot, however, that at the time there was a wooden hoarding round the base, which cut off the basement storey. As soon as this was taken away the building gathered weight and importance, and it is clear that now the vases would be appropriate enough.

(*To be concluded.*)

## THE "OLD" WATER-COLOUR SOCIETY.

THE Summer Exhibition of the Royal Society of Painters in Water Colours at Pall Mall comes as a welcome harbinger of spring. The majority of the pictures tell of sunny hours and sunny scenes; though by this we do not mean that the artists have all gone out of England for their subjects. Indeed, the reverse is really the case, as was to be expected so long as the President of the Society—Sir Ernest A. Waterlow, R.A.—is content with rural England. To the present exhibition he has sent twelve works, nearly half of which are taken from the neighbourhood of Pulborough, Sussex. This is a district which is becoming more and more favoured by artists, who find there a wide variety of scenery still unspoilt by modernism, though this latter characteristic appears to be slowly vanishing. The President's style and orthodox manner make an arresting contrast with that favoured by many of the other bright particular stars of the Society. For example, his "A Bridge on the Marsh near Pulborough" (3) should be compared with "Iona, Sunlit Sea" (6), by Mr. James Paterson, or "Under the Rialto" (7), by Mr. John S. Sargent, R.A., or even with No. 14, "By the Dancing Rills," by Mr. J. W. North, A.R.A. The work of Sir E. A. Waterlow is marked by painstaking thoroughness and attention to the minute details; it is like a beautifully printed page out of nature's book. Mr. Sargent and Mr. James Paterson are attracted towards a sketchy memorandum style which only gives the essentials, and from which the onlooker must create his own mental pictures. Mr. Sargent's two contributions are "Under the Rialto" and "Base of a Venetian Palace"; they are authoritative and decisive, but appear to err in giving too little assistance to the spectator. Mr. Paterson is more detailed, and really concentrates his attention on some particular part of the picture, the remainder being made to emphasise that part.

Most of the familiar exhibitors at this the "Old" Water-Colour Society appear once more, and help towards an exhibition that is full of interest. Mr. Reginald Barratt sends further drawings from India which are full of brilliant light. Two of the four contributions by Mr. Herbert Marshall treat more or less of architecture: the "Lincolnshire Marshland" looks towards the Boston Stump, and "Ludgate Hill from the Steps of St. Paul's" shows prominently the unusual spire of St. Martin's Church. Mr. R. Thorne-Waite is another artist who still finds a sufficient number of beauty spots in England to monopolise his twelve sketches. On the other hand, Mr. R. W. Allan has drawn upon three continents for sketches, only leaving the New World untouched. Mr. Albert Goodwin, as usual, has gone out of the country. In "The Pyramids" he has given a new reading of a well-worn subject, and he arouses a feeling of awe as distinct from the feeling of wonder or delight which seems the more usual object of painters. The spot chosen is at the very foot of, and within the shadow of, one of these towering structures. A novelist recently asked, "Isn't a rose more wonderful, more mysterious than all the pyramids Egypt ever built to hold the corpses of a few conceited men?" To most minds a rose must arouse different sentiments to what are prompted by the Pyramids. Mr. W. Mathew Hales finds most attraction in Venice. Among other artists who as usual have sent are Mr. H. Clarence Whaite, Mr. T. M. Rooke, Mr. Arthur Rackham, Miss Clara Montalba, Mr. Huges-Stanton, Mr. J. H. Lorimer, Mr. Tom Lloyd, and Mr. J. Jessop Hardwick.

It will thus be seen that the "Old" Water-Colour Society offers many attractions of the expected kind, and in addition there are unfamiliar contributions which add to the interest.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) makes its latest issue to hand, as far as illustrations are concerned, a monograph of the work of Mr. Guy Lowell, including "a building for music," at Bar Harbour, Me., in Greek Ionic, and a house at Bar Harbour, a severe and refined study in Italian Renaissance.

*La Construction Moderne* (Paris) illustrates the Villa Medici, the home of the French school at Rome, and a house for an artist at Levallois-Perret, of which M. Cuinat is the architect. Continuing its account of old Paris our contemporary now deals with the Quartier de Grève.

*Berliner Architekturvelt* (Berlin). It is refreshing for a change after the preponderance of "new-art" principles to find in German architecture that it is still possible to design a modern building with originality at the same time that traditional detail is employed. Such we have in the Imperial Bank building at Nuremberg, designed by Herr Julius Habicht. The remaining buildings illustrated are all "new art," including the premiated designs for the extension of the big shop of A. Wertheim in Berlin.

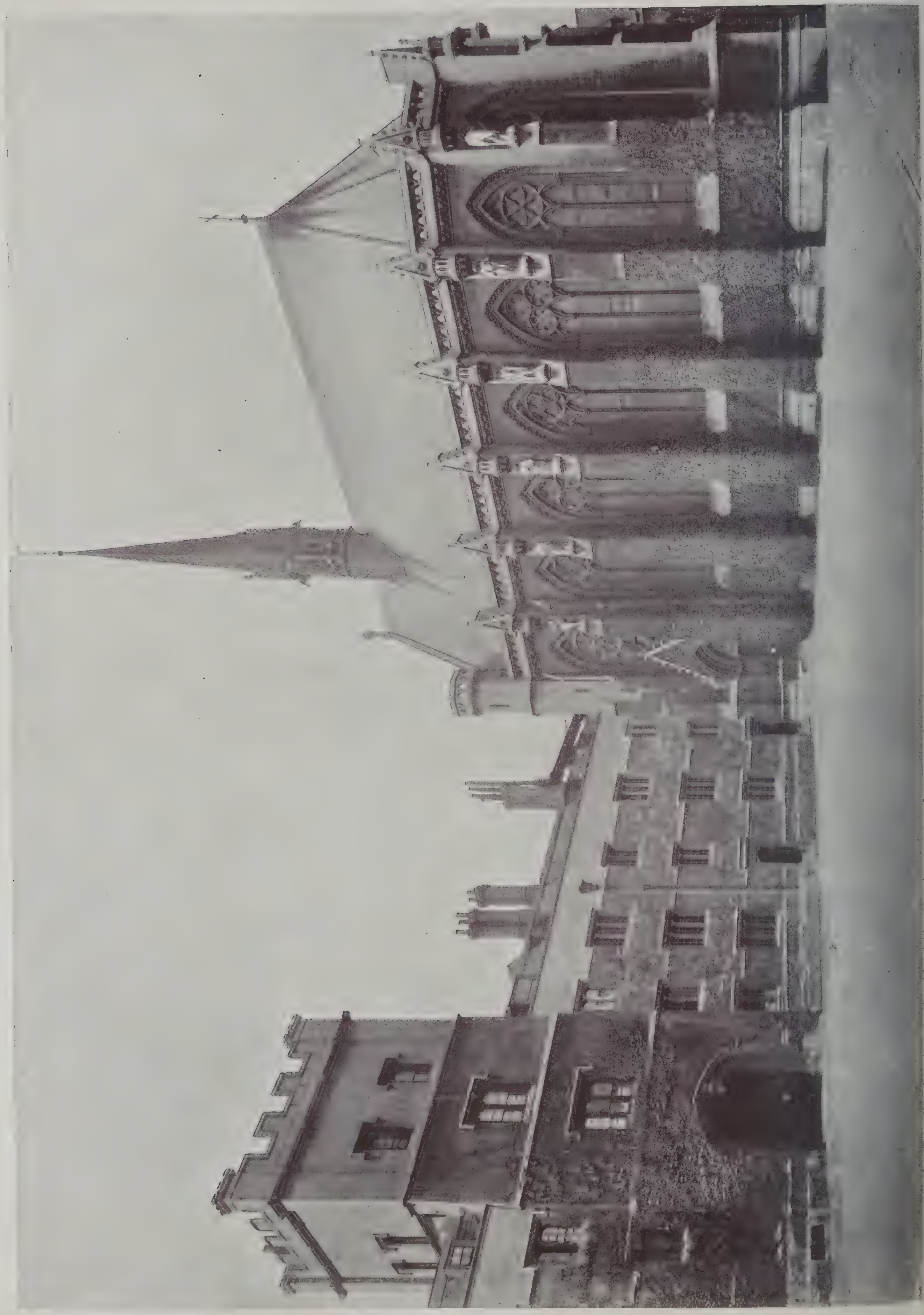
*Stone* (New York) exults over the collapse of a reinforced concrete bridge in Indiana, which is illustrated. The bridge was finished last October, and has been in use ever since. The principal illustrations are of the high altar of the cathedral of Toulouse, a carved tympanum panel over the entrance of St. Mary's Church, New York, and the new building of the Daughters of the American Revolution at Washington, of which Mr. Edward Pierce Casey is the architect. Of course, all these are examples of work in stone.

*Zodtchy* (St. Petersburg) in addition to a chapel at St. Petersburg, illustrates a series of examples of typical motifs of Chinese architecture.

*Engineering Record* (New York) sends us a colossal "Annual Contractors' Number," in which an account is given of the bodily raising of a four-storey brick factory building to a height of 8 feet, and insertion of new concrete walls below. Another interesting job described is the extension upwards of the Seventh Regiment Armoury, New York. The construction of the foundations of the new municipal building for the City of New York is described and illustrated.

Leith Dock Commission have had under consideration th question whether they should erect a plant for providin their own electricity supply or continue their present arrangement with the Town Council. A deputation recentl appointed to obtain information as to the best plant t use in the production of electricity have visited various town in England, and it is understood that their recommendatio will be in favour of the use of gas producer plant. Th Commission has not yet decided whether they will generat their own electricity for power and lighting in the docks o not.

A new variety theatre is to be erected in Glasgow Recently two plots of ground, extending together to abou 1,024 square yards, with the tenements of shops and dwelling houses forming Nos. 149 to 155 Castle Street, were pu chased by Mr. A. E. Pickard. It is his intention to erect o the site a theatre to be called the Glasgow Casino. Th theatre will have a frontage to Castle Street of 70 feet.



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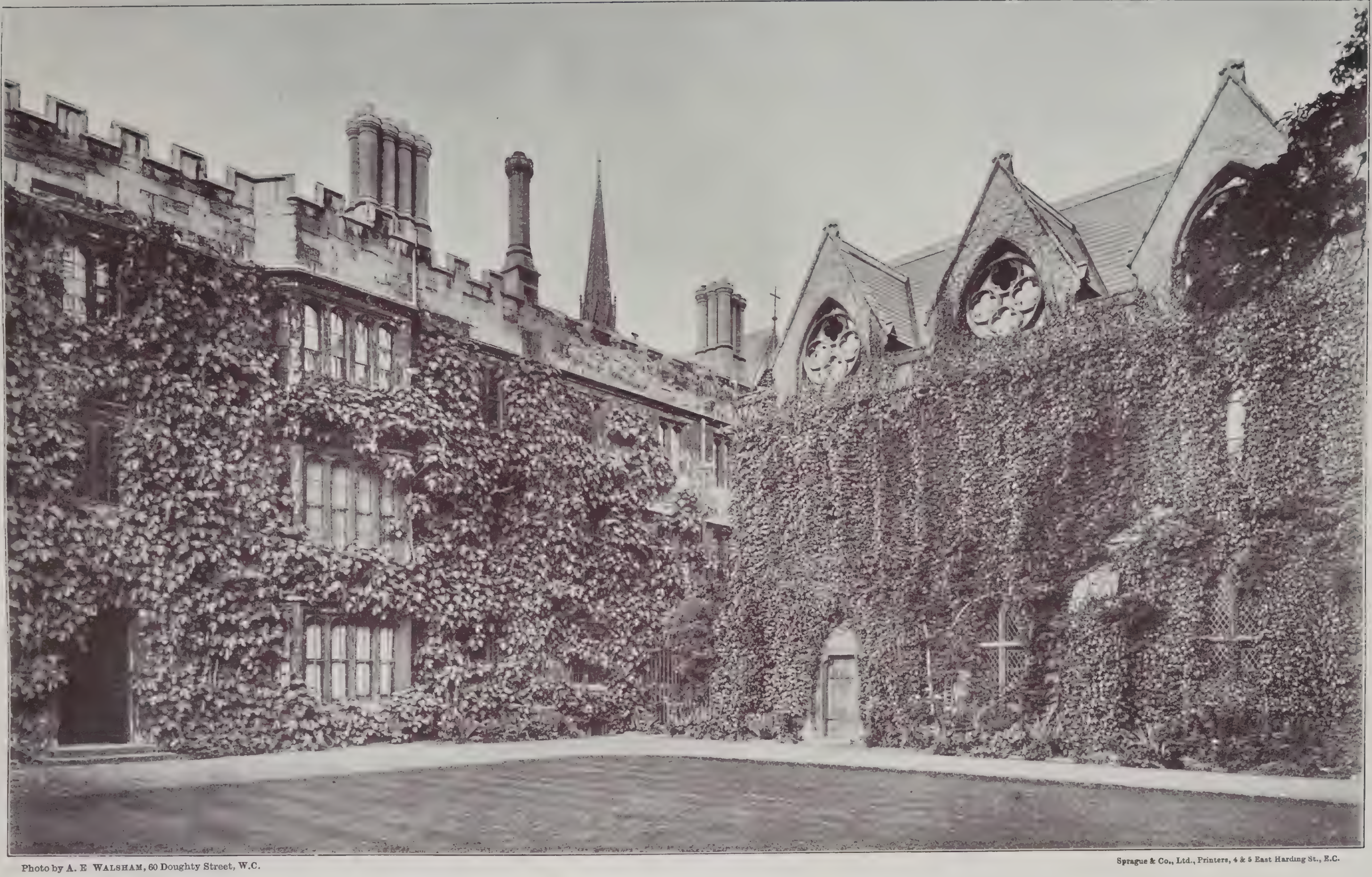

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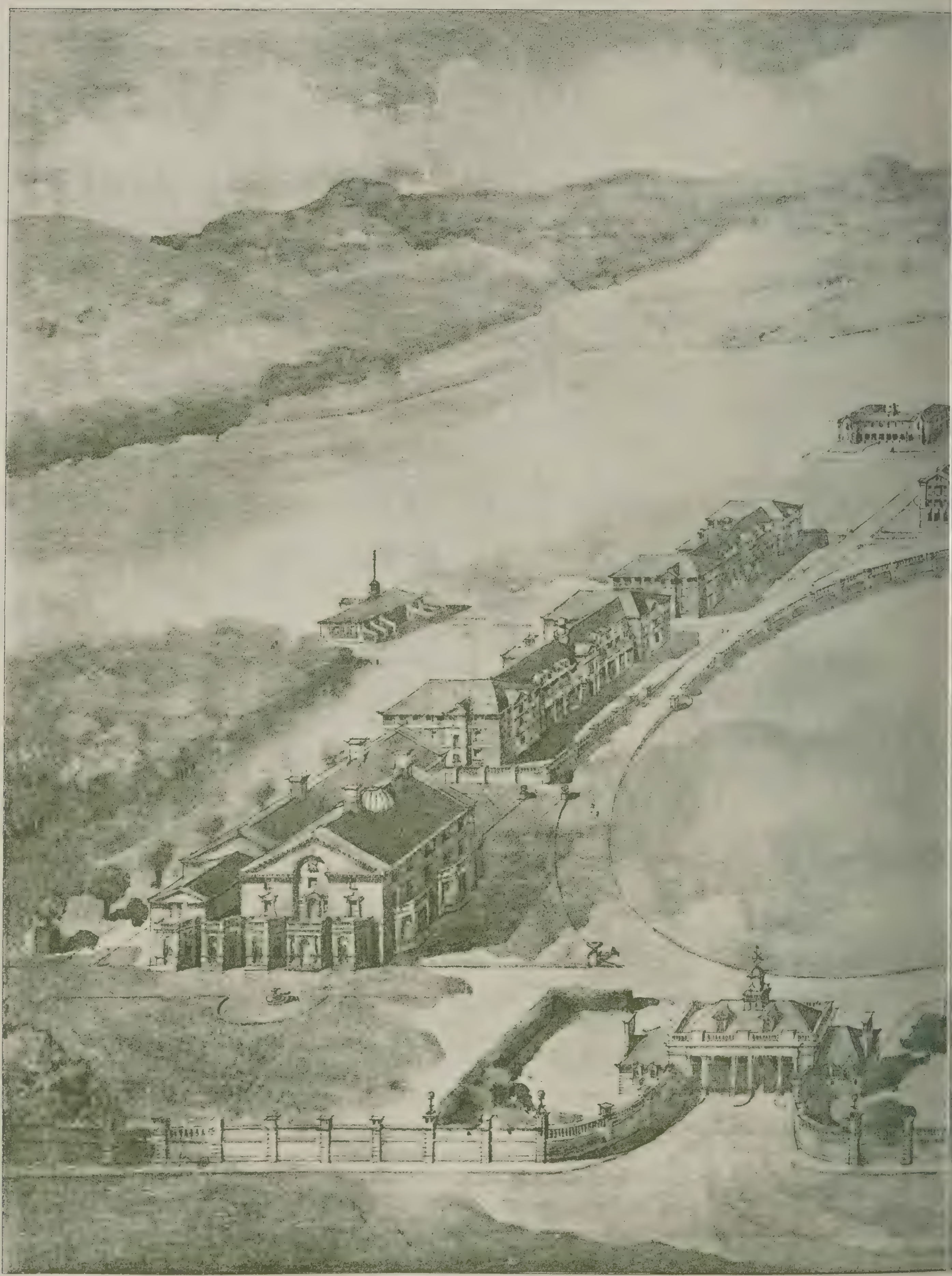

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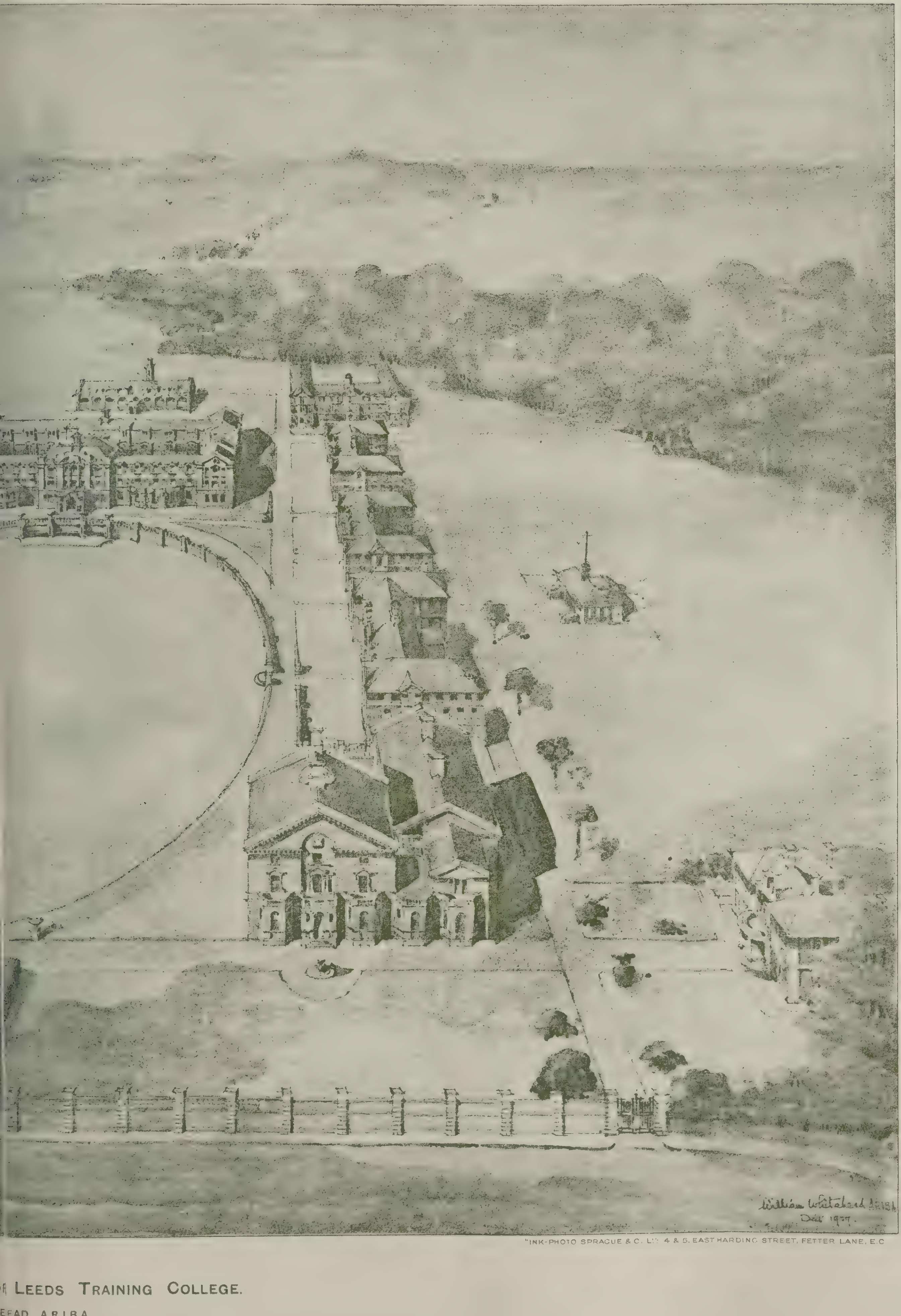
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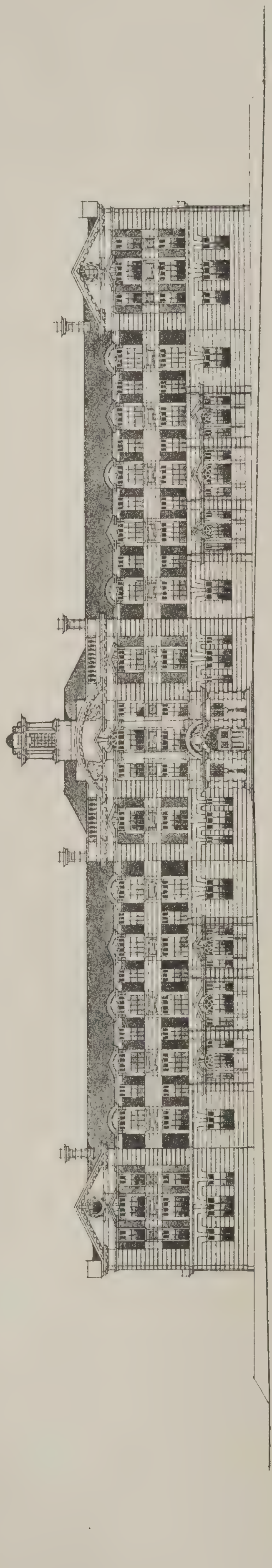

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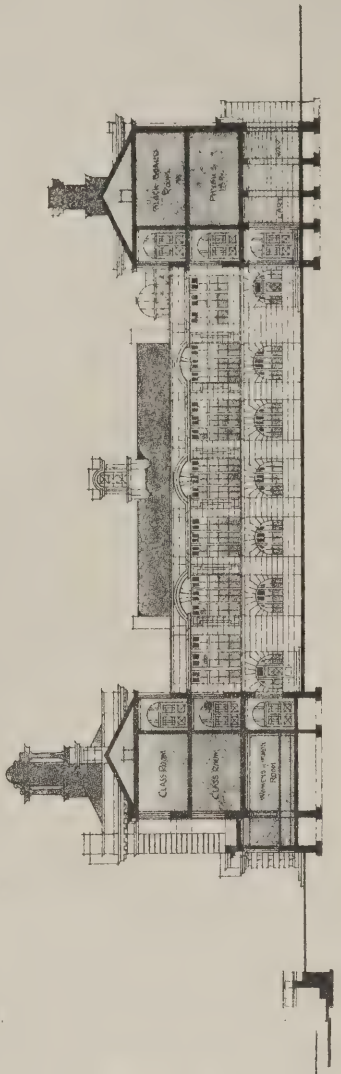

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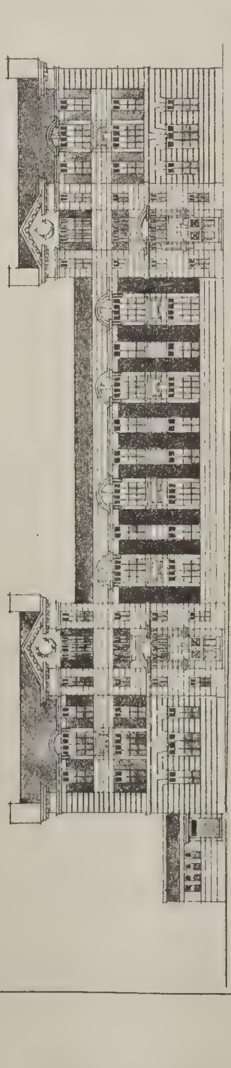
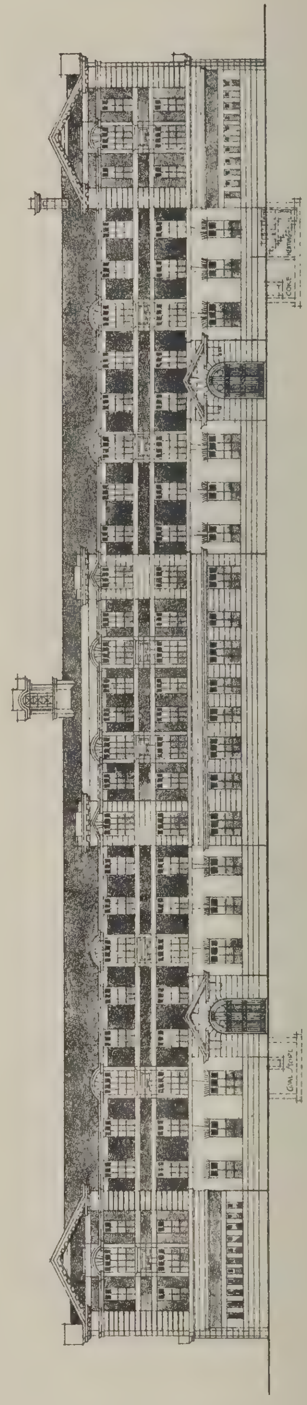
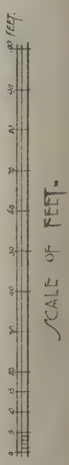


WEST ELEVATION

* EAST ELEVATION SIMILAR *



NORTH ELEVATION



SCALE OF FEET.

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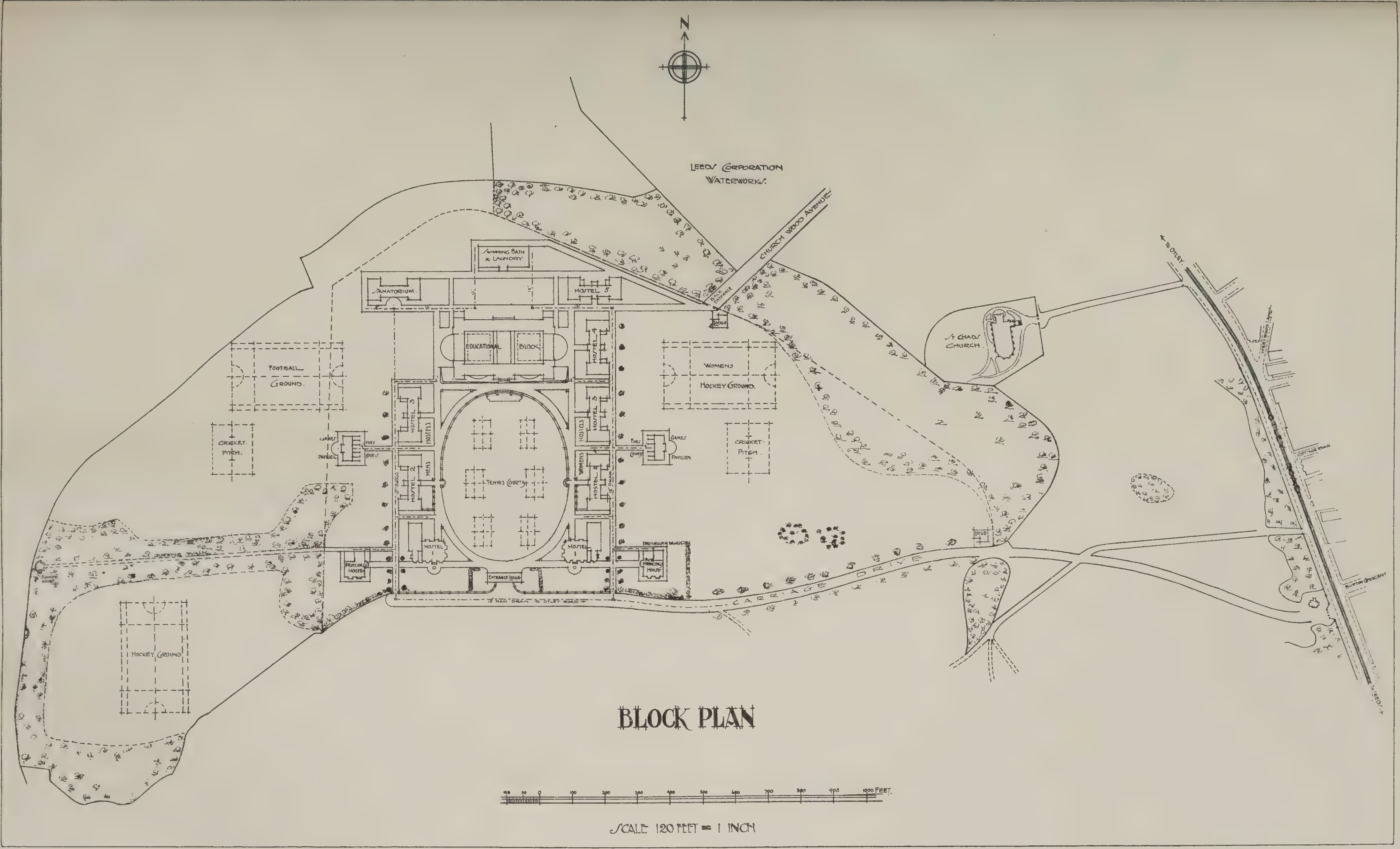

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COMPETITION DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.

By Mr. WILLIAM WHITEHEAD, A.R.I.B.A.

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# The Architect.

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## FORTHCOMING EVENTS.

*Friday, April 29.*

Architectural Association : Paper on "The Architecture of Bath," by Mr. Mowbray A. Green, A.R.I.B.A.

Royal Sanitary Institute : Meeting at Worcester. Discussions on "Teaching of Sanitary and Domestic Science in Schools" and "Building By-laws Reform."

*Monday, May 2.*

Royal Institute of British Architects : Annual General Meeting.

Royal Society of Arts : Mr. A. B. Searle on "Modern Methods of Brickmaking." (Cantor Lecture 4.)

Royal Academy : Summer Exhibition opens.

*Wednesday, May 4.*

Royal Archæological Institute : "Notes on the Holy Blood of Hayles," by Mr. W. H. St. John Hope.

Iron and Steel Institute : Annual General Meeting (two days).

*Thursday, May 5.*

Architectural Association : Annual Dinner at the Trocadéro.

## ELEMENTS OF REINFORCED CONCRETE CONSTRUCTION.

NOWADAYS we all believe, more or less, in reinforced concrete, and realise that it is a method of construction with peculiar advantages on occasion. Hence we all desire to know something of the elementary principles that underlie the application of reinforced concrete to building. Numerous authors have striven to satisfy our desire for information. The standard work on reinforced concrete in this country is that by Mr. CHARLES F. MARSH and Mr. WILLIAM DUNN, and for those who require a thorough and complete knowledge of the subject it is indispensable; but there are many who cannot afford the time and attention to attain such complete mastery, and for their benefit smaller and simpler works have been recently produced, some of which we have now before us.*

We all understand that the fundamental principle of reinforced concrete construction is that the power of concrete to resist compression being considerable, the fullest advantage shall be taken of that power, but that the material being comparatively very weak in resisting tension, this stress shall be met by the assistance as reinforcement of a material strong in the capacity to sustain tensile stress.

From this simple proposition it is, however, necessary to proceed very much further in order that a proper relation between the two components of reinforced concrete may be established in respect of their position and mass may be preserved, so that their individual functions may be most economically fulfilled.

To do this with accuracy has required a large amount of scientific experiment and investigation, so that a reliable basis may be obtained for calculation of the requirements of the material in specific cases. Mr. MARSH in his book treats, with no more than sufficient fulness to ensure a proper understanding of the essentials, the scientific data on which calculations must be based, explaining what has been determined as to the properties of reinforced concrete and its behaviour under loading, as shown by the experiments of many investigators, leading to the assumption of certain hypotheses on which to base calculations. With a branch of construction at present, as far as absolute scientific knowledge of its many complexities has reached, still in its infancy, it is unfortunately by no means certain that these hypotheses are absolutely true.

Mr. MARSH formulates them thus: that the applied forces are perpendicular to the neutral surfaces of pieces subjected to bending; that each fibre of the concrete acts by itself, not being affected by the contiguous fibres; that there is always a solid contact between the reinforcement and the surrounding concrete; that plane sections remain true planes during loading; that there are no initial stresses on the structure before loading; that the resistance of the concrete in compression in pieces subjected to flexure varies uniformly from nil at the neutral axis to a maximum at the outer fibre; that the ratio of the moduli of elasticity of the steel and concrete is 15.

Some of these hypotheses are obviously incorrect, but their assumption is on the side of safety and necessary to enable formulæ for calculation to be propounded which may be relied upon for practical work, although the results of experiments may show that they do not reach finality in the reduction of material employed to the utmost minimum in every particular case.

Mr. MARSH gives a list of the symbols used in the methods of calculation, but these are necessarily not in accord with the standard notation recently suggested by the Science Standing Committee of the Concrete Institute. It is certainly desirable that a standard notation should be adopted by all writers on comparatively new methods of calculation such as apply to reinforced concrete. Mr. MARSH shows the method by which formulæ are obtained for the calculation of a large number of problems in reinforced concrete construction, and gives especially careful attention to arches of various forms and conditions. The application of the formulæ is to be found in the author's "Manual of Reinforced Concrete," to which the present volume is intended to be a companion. Some of the methods at present in use for introducing reinforcement are given in the concluding chapter.

Mr. RINGS in his book treats the subject of reinforced concrete from a practical rather than scientific standpoint, and after a short review of the history of the subject deals with practical details relating to materials and execution of work, including machines for concrete mixing and for shaping of rods, centring or "falsework" for the reception of concrete, and various arrangements for the placing of reinforcement. Some particularly useful details of the construction of roofs in concrete may be specially noticed.

In dealing with formulæ and methods of calculation, Mr. RINGS adopts the system of notation suggested by the Science Standing Committee of the Concrete Institute, but does not go beyond simple forms of slabs, beams, ribbed ceilings or T beams, columns and arches. Following the practical rather than the scientific line, the author gives a description of several of the various systems of reinforced concrete construction, patent bars, &c., now used in this country, and of them he says "all of these bars and systems have certain advantages under certain conditions and circumstances, and if used in their right places may tend to improve the soundness of the construction and reduce cost." A series of tables is included in the book to facilitate the calculation and design of reinforced concrete and render easy the path of the novice. To such an extent is this simplification carried that a ready reckoner is supplied, by which mechanically the thickness of a floor-slab and the sectional area of the steel reinforcement required for specific loads and spars can be read off. Mr. Rings's book is therefore admirable as a primer for the student who wants a practical introduction to construction in reinforced concrete.

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* *A Concise Treatise on Reinforced Concrete.* By Charles F. Marsh, M.Inst.C.E., M.Am.Soc.E., M.Inst.M.E. (London : Constable & Co., Ltd. 7*s.* 6*d.* net.)

*Reinforced Concrete: Theory and Practice.* By Frederick Rings, M.S.A. (London : B. T. Batsford. 7*s.* 6*d.* net.)

*The Elements of Reinforced Concrete Building.* By G. A. T. Middleton, A.R.I.B.A. (London : Francis Griffiths. 4*s.* net.)

*Inspector's Handbook of Reinforced Concrete.* By Walter F. Ballinger, Assoc. Am. Inst. of Architects, M.Am.Soc.C.E., and Emile G. Perrot, Assoc. Am. Inst. of Architects, Assoc.M.Am.Soc.C.E. (New York : The Engineering News Publishing Company. London : Archibald Constable & Co., Ltd. 4*s.* net.)

Mr. Middleton directs the attention of his readers chiefly to calculations, and aims at making the comprehension of those calculations and their methods easy to the rudimentary student. We do not know why Mr. Middleton starts from the basis that "the modulus of elasticity of steel is approximately ten times that of concrete," when the majority of governments, societies, and committees who have issued rules, recommendations, or regulations on the subject have taken 15 as the value, and it would appear from experiment that 17½ is nearer the truth. Mr. Middleton's calculations do not extend beyond simple problems of beams, slabs, columns, and walls, and his endeavour to produce a small book leads to a restriction of the description of material and workmanship to very elementary facts and practice.

The little handbook by Messrs. Ballinger and Perrot is intended primarily for the use of "inspectors," or, as we call them in this country, clerks of works, and hence deals with practical operations of workmanship more than with calculations. At the same time, some very simple tables and rules are given for determining the safe loads on slabs, beams and columns in accordance with the usual practice in Philadelphia.

The literature of the present day on the subject of reinforced concrete is not confined to nor even so thorough in English as in other languages, and the difficulty of reading in a foreign tongue on a subject so comparatively modern renders necessary a dictionary of technical terms. In the Deinhardt-Schlomann series there now appears* such a dictionary, giving the terms in German, English, French, Russian, Italian, and Spanish. Some of the English equivalents are rather too literal translations of the German, but numerous illustrations assist to correct verbal inadequacies, and the work is eminently useful.

## NOTES AND COMMENTS.

The Society of Architects has had an unpleasant experience in the result of its action to restrain "a builder and architect," as the report goes, from using the letters M.S.A. after his name, although he is not a member of the Society. The Society, as plaintiff, asked for an injunction, but although the defendant did not enter any appearance to the action, Mr. Justice Joyce declined to grant any injunction and dismissed the action, and in his judgment said that "this was the case of a private joint stock company, which for payment purported to give people the right to use a certain combination of mystic letters the meaning of which, his lordship ventured to say, nobody in the Court, except counsel for the plaintiffs, knew." Thus anyone, whether a member of the Society of Architects or not, can use the letters M.S.A. after his name, and consequently these are of no value. Mr. Justice Joyce appears to have been influenced in his decision by the consideration that the Society of Architects is not a chartered body. The only thing, it seems to us, that members of the Society can do is to drop the use of the letters M.S.A., and, unless already Fellows or Associates, join the Royal Institute of British Architects as Licentiates.

The parishioners of Puddletown Church have disregarded the opposition to the proposed reinstatement of the chancel of their church which some vandals, two or three centuries ago, reduced to half its original size, and we think they are quite right in so doing.

St. Asaph Cathedral has been discovered to be in need of urgent repair. Some slight cracks of long duration in the walls of the south transept have recently been observed to be expanding and supplemented by a fresh one; and Mr. Stuart Thompson, of Peterborough, has been consulted, and has advised that an expenditure of 700*l*. to 800*l*. is necessary. Mr. Thompson in his report states that cracks have appeared in the eastern wall of the transept, the stonework being torn above and below the two windows, and that one of the windows is still moving. He ascribes the primary cause of the trouble as being due to defective foundations, the actual footings of the walls being nothing more than rough stones laid in mud and with no projection. He opines that the defective footings of the whole of the transept will have to be carefully removed and new solid cement concrete inserted under the walls, with a good spread outwards to distribute the weight of the superstructure over as large an area as possible, the masonry being pinned up with hard brickwork in cement. Mr. Thompson further states that recent investigations show that the whole of the land between the two rivers is gradually sinking, and therefore it is essential that the foundations when completed should be continuous throughout, and not likely to be broken through by any unequal subsidence of the clay or shrinkage of the subsoil. To guard against this he proposes the use of armoured concrete and taking it below the range of atmospheric influence.

From the report of the Council of the Surrey Archæological Society, presented to the annual meeting held last Saturday, we learn that the future preservation of Whitgift's Hospital, Croydon, may now be regarded as assured.

During the next ten years immense changes will be made in the planning of Paris, to the alterations and extensions of whose main arteries and other improvements some sixty millions sterling is to be devoted. The schemes of Baron Haussmann are to be resumed, the Boulevard Haussmann to be joined up with the main system of boulevards. Better access is to be provided to the Central Markets and many other widenings of existing thoroughfares are to be made. Needless to say, much of the old Paris of the period of Henry IV. and Louis XIII. will be swept away.

An interesting paper on stained glass, from the earliest period to the Renaissance, read before the Oxford Architectural and Historical Society by Mr. Herbert W. Bryans, has been "printed by request," and is now published by James Parker & Co., at the price of one shilling. This is an interesting epitome of the history of the mosaic method of glass-painting, described by an expert, with due explanation of so much of technique as is necessary for the comprehension of what is good in the craft with which the author deals.

The Home Secretary has appointed Mr. H. J. Wilson, inspector of factories, Glasgow; Mr. W. W. Squire, M.I.C.E., engineer to the Bristol Docks Committee; and Mr. C. A. Harrison, D.Sc., engineer's office, North-Eastern Railway Company, Newcastle-on-Tyne, to be a committee to inquire into the dangers attending deep excavation in connection with the construction of docks and other similar works, and to consider and report what steps should be taken to minimise such dangers. Correspondence may be addressed to Mr. H. J. Wilson, 74 York Street, Glasgow.

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* *The Deinhardt-Schlomann series of Technical Dictionaries.* Vol. VIII. Reinforced Concrete in Sub- and Superstructure. Compiled by Heinrich Becher. (London: Constable & Co., Ltd. 6*s*. net.)

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### VIII.—INSULATION.

HAVING considered the refrigerating machine itself, and its behaviour under varying conditions, we come now to its practical applications. The extent of these has already been sketched out and it will have been noticed that, in the majority of cases, some form of cold store, similar to those cooled by ice, but of larger dimensions, is required. Such a store must necessarily be well insulated, and this, in the case of mechanical cooling, is more especially true, since not only are the storage temperatures lower, but the machine is frequently run only for a portion of the day. This means that during the remainder of the twenty-four hours the "cold" (if the inaccuracy will be excused), which is accumulated by the running of the machine, is gradually used up, owing to the leakage of heat into the chamber. The consequence is that unless precautions are taken to minimise any such leakage, the temperature, when the time comes to restart the machine, is again quite high. Now a uniform temperature is always a desideratum, and is sometimes an absolute essential. Hence our object must be to eliminate all defects which tend to cause a variation. The chief of these is leakage through the insulation, and it is proposed, therefore, to devote some attention to modern practice in this branch of refrigeration.

A

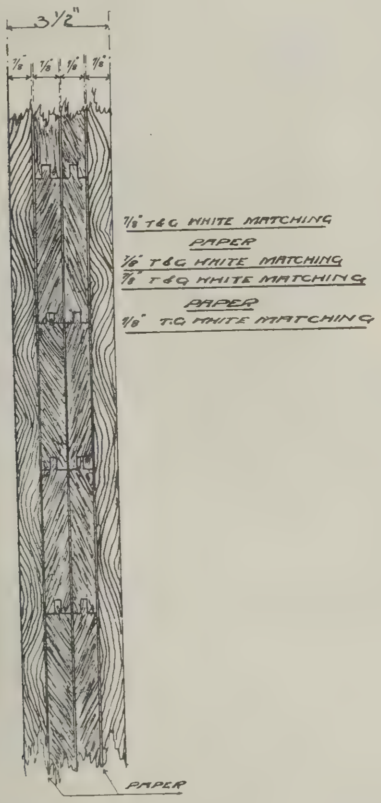

Fig. 22.—Heat leakage in B.T.U.'s per square foot per 24 hours per degree Fahr. temperature difference —4·75.

*Sections of Insulation.*—Since the success of a cold store depends to such an extent on the insulation, it is natural that a considerable amount of research work should have been carried out in this connection. As a result of these researches an endless variety of constructions has been put forward, each with its own strong advocates. Every maker almost has his own ideas on this subject. In fact were we to attempt a literal description of even those sections alone which have proved commercially successful, quite a respectable volume could easily be filled. In this place, however, only the more salient types will be selected, and these will be examined minutely with a view to ascertaining (as nearly as the data available will permit) which gives, in actual practice, the greatest return for the money spent in construction. It would of course be possible, were the stopping of the heat leakage our only object, to attain to an almost ideal efficiency, but it must be recognised that in the search after perfection there are certain practical limitations which must not be exceeded. What these actually are it will be our aim to discover.

Insulation may be formed either of air spaces created by timber distance pieces or of suitable filling material packed between timber battens, or of a combination of both. Broadly speaking, the first is more characteristic of American and the second of British design. But, as this branch of engineering has been so much more highly developed across the Atlantic than it has been here, some attention must be paid to both the prominent styles. In figs. 22 three different sections are shown and the coefficient of heat leakage allowed by each marked at the bottom. The first (A) shows a very simple section consisting of four ⅞-inch T and G boards and

B

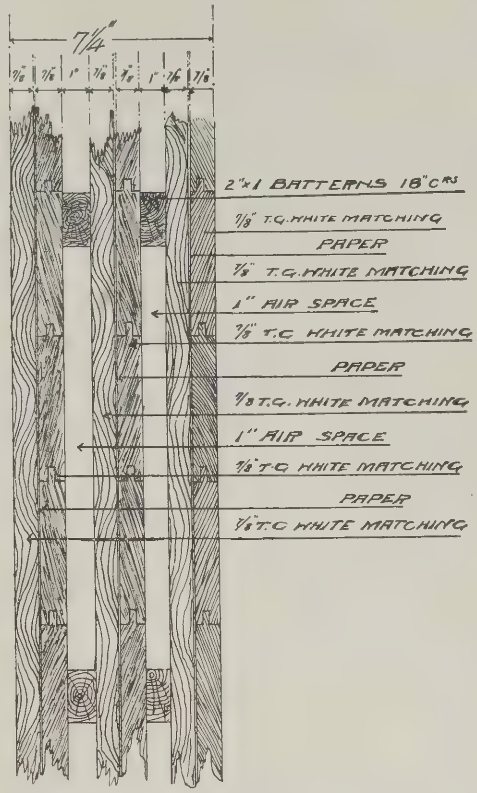

Fig. 22.—Heat leakage in B.T.U.'s per square foot per 24 hours per degree Fahr. temperature difference, 3·45.

C

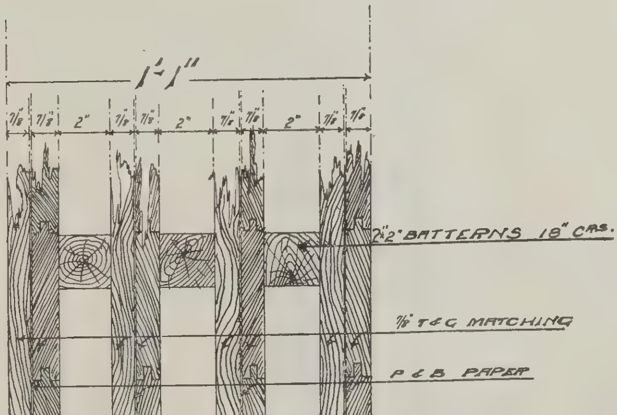

Fig. 22.—Heat leakage in B.T.U.'s per square foot per 24 hours per degree Fahr. temperature difference —2·70.

two courses of black insulating paper. Joints are broken where the paper is inserted, and the matching at the inside and the outside is arranged to be vertical for the sake of appearances. It could also, with advantage, be made beaded or vee-ed as either of these forms will add considerably to the look of the work. Such a section as this is, of course, very seldom found, unless in the cheapest ice boxes, and it is introduced merely to show the high heat leakage it permits when compared with really scientific insulation.

Section B is rather more elaborate, and comparing it with A we find we have added two more layers of $\frac{7}{8}$-inch T and G boarding, an extra ply of paper and two one-inch air spaces. Joints are broken as before and the matching (which should in this case also be beaded or vee-ed where seen) is vertical at the inside and outside of the section. The result, as will be seen, is a saving of 1.3 B.T.U.'s in the heat leakage.

In the third section (C) we have a yet more complicated construction, which involves an extra air space, two additional layers of $\frac{7}{8}$-inch T and G, and one more ply of insulating paper. The benefit accruing therefrom is a reduction of the heat leakage by another 0.75 B.T.U.'s.

These three sections give some idea of air space construction and what effect an increase in its complication has on the efficiency of the section. In figs. 23 two more sections are given. D represents insulation by filling material without air spaces, and E shows a combination of the two systems. Four inches only of filling material is used in D, and is packed between 2-inch by 4-inch battens spaced 16 inches to 24 inches apart, sheeted on either side with two layers of $\frac{7}{8}$-inch T and G boarding. Each pair of boards is separated by a ply of paper and joints are broken in the usual way. In E there are altogether four double layers of $\frac{7}{8}$-inch T. and G. boarding, each separated by insulating paper. Between are three spaces, created by suitable battens spaced at 18-inch centres. The first of these, 2 inches deep, is air, the second, 4 inches deep, is filled with insulating material, and the third, 1 inch deep, is air again. In both sections the heat leakage has been given, on the assumption that the filling material is granulated cork.

D

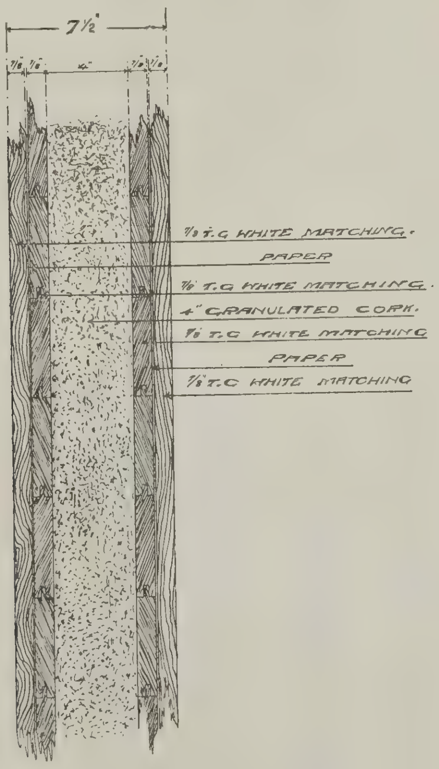

FIG. 23.—Leakage in B.T.U.'s per square foot per 24 hours per degree Fahr. temperature difference —1·70.

The question now is, Which of these various ways of insulating is the best commercially? We must know, in other words, which will effect the largest saving for the least expenditure. Hence there are two factors to be considered in any calculations which we may make. The one is to be as large and the other as small as possible. We must, in fact, show clearly how far the two conditions are fulfilled simultaneously, and, to this end, it is proposed to make out a miniature profit and loss account for each section. On the credit side will be the coal saved per annum in running the plant (due to the diminution in heat leakage through the insulated walls), and on the debit side, the interest and depreciation on the capital sunk in building.

The former item will be valued by assuming a steam-driven refrigerating compressor of rather low efficiency, in order to favour the insulation as much as possible. It will be taken as eliminating 3,500 B.T.U.'s for every pound of coal burnt in the boilers. The second item cannot be estimated exactly, but, by allowing for both interest and depreciation 10 per cent. per annum on the initial cost of the insulation, we shall be fairly near the mark. The balance or deficit, as the case may be, will then show what the insulation is really worth.

E

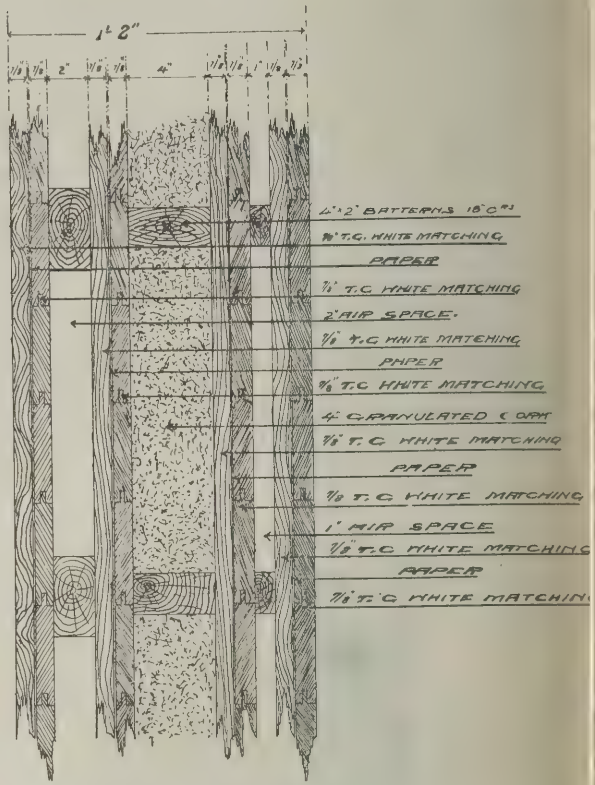

FIG. 23.—Leakage in B.T.U.'s per square foot per 24 hours pe degree Fahr. temperature difference —1·15.

For this purpose all the other sections (B, C, D and E) will be compared with section A as a standard, and to simplify matters we shall take a definite numerical example. It will be assumed that we have a cold room, in shape a perfect square, with no partitions and with a uniform section of insulation on floor, ceiling and walls, across all of which the average temperature difference is to be 50° Fahr. The dimensions of this room are 69 feet by 69 feet by 9 feet high, yielding a radiating surface of 12,000 feet super and a cubic capacity of nearly 43,000 feet. Such a store, if maintained constantly at 24° Fahr., when well loaded with produce, would require all the attention of a 50-ton compressor (*i.e.*, fifty tons ice melted or twenty-five tons ice made) for twenty-four hours per day. It is further assumed, in estimating the constructional costs, that the work is carried out in London, and no account has been taken for simplicity's sake of extras, such as doors, air-circulating devices, partitions, special floor construction, &c. A case such as this is, it is true, purely theoretical, but for the end we have in view the figures it shows will be sufficiently accurate.

Taking section B we find that compared with section A the B.T.U.'s saved per foot super in twenty-four hours per degree difference in temperature equal 1.30. This is equivalent to a saving for 50° Fahr. temperature difference of $1.30 \times 12{,}000 \times 50 = 780{,}000$ B.T.U.'s per day on the chamber to the particulars given, which means (assuming 3,500 B.T.U.'s per pound of coal) an economy of 36.5 tons coal per annum. The financial saving, with coal at 20*s*. per ton, will then be 36*l*. 10*s*.

The additional elements brought into the construction to effect this economy consist of two 1-inch air spaces, formed by means of 2-inch by 1-inch battens at 18-inch centres, two extra layers of $\frac{7}{8}$-inch matching, and one extra course of insulating paper. Carried out in London, the extra cost for building would probably, allowing for labour and the builders' running expenses and profit, amount to about 6½*d.* per foot super. This, for our ideal store, gives a total of 325*l.*, and 10 per cent. on this figure for interest and depreciation means 32*l.* 10*s.* per annum, showing a net saving of 36*l.* 10*s.*, less 32*l.* 10*s.*, or 4*l.* in the course of the year.

These calculations can be carried out in the same way for sections B, C, D and E, and we may then tabulate, as follows, our assumptions and results:—

*Assumptions.*—Work carried out in London; ideal store with 12,000 square feet of surface; all walls are outside walls; insulation of floor and ceiling same as for walls; nothing allowed for doors, &c., in costs; temperature difference =50° Fahr.; cost of coal = 20*s.* per ton; efficiency of compressor =3,500 B.T.U.'s per pound of coal.

*Results*, compared with section A:—

| Section. | B. | C. | D. | E. |
|---|---|---|---|---|
| Saving in heat leakage, B.T.U.'s per sq. foot per 24 hours per 1 deg. temperature difference | 1.30 | 2.05 | 3.05 | 3.60 |
| Total B. T. U.'s saved per day | 780,000 | 1,230,000 | 1,830,000 | 2,160,000 |
| Tons of coal saved per annum | 36.5 | 57.3 | 85.2 | 100.6 |
| Extra cost of insulation per sq. ft. | -/6½ | 1/0½ | -/4½ | 1/3 |
| Total cost | £325 0 0 | £625 0 0 | £225 0 0 | £750 0 0 |
| Total saving per annum | 36 10 0 | 62 10 0 | 85 4 0 | 100 12 0 |
| Interest and depreciation | 32 10 0 | 57 6 0 | 22 10 0 | 75 0 0 |
| Net saving per annum | 4 0 0 | 5 4 0 | 62 14 0 | 25 12 0 |

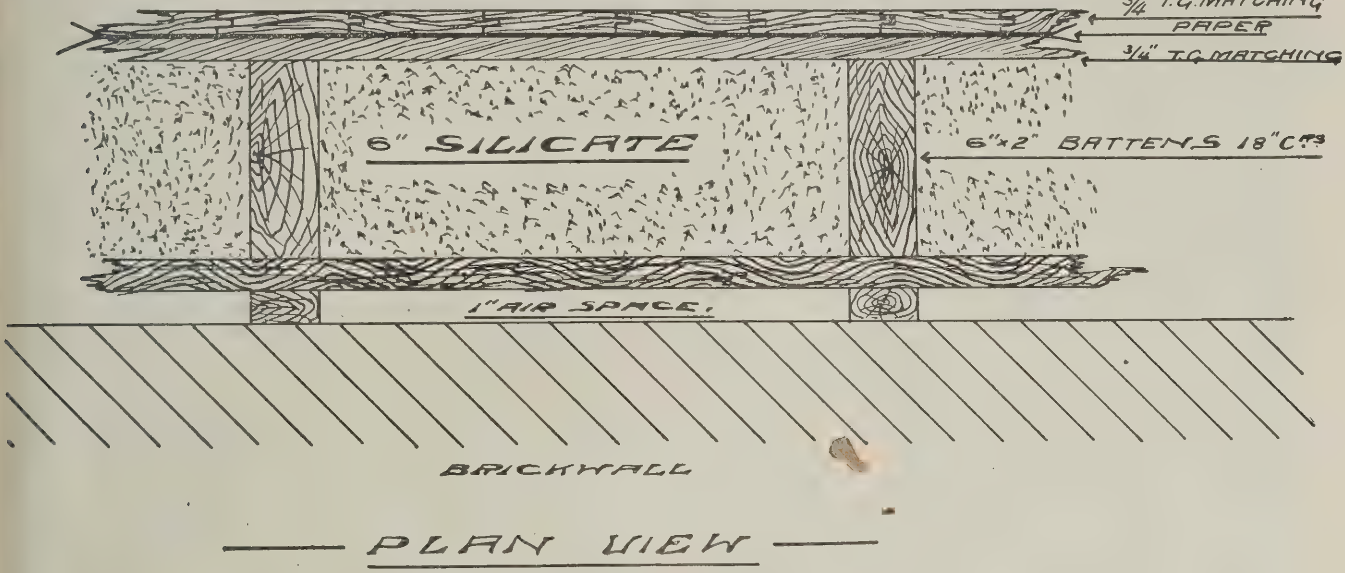

Fig. 24.

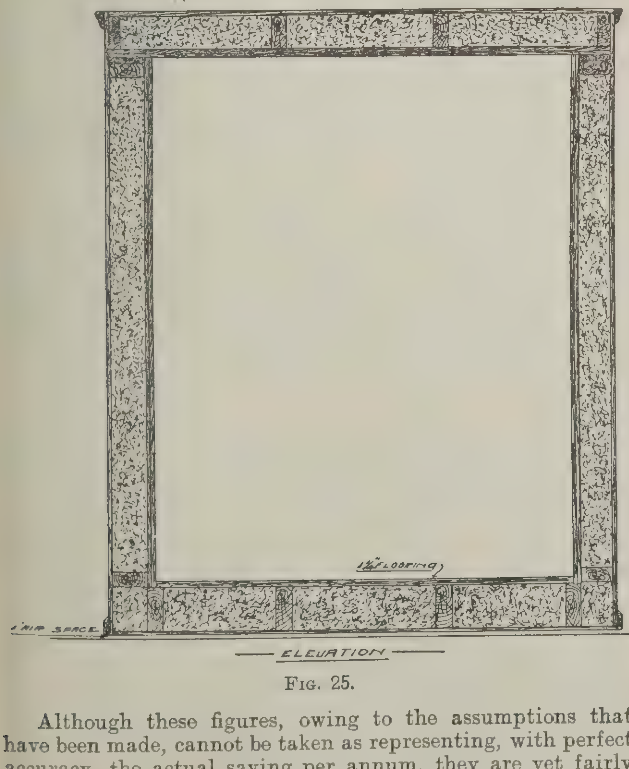

Fig. 25.

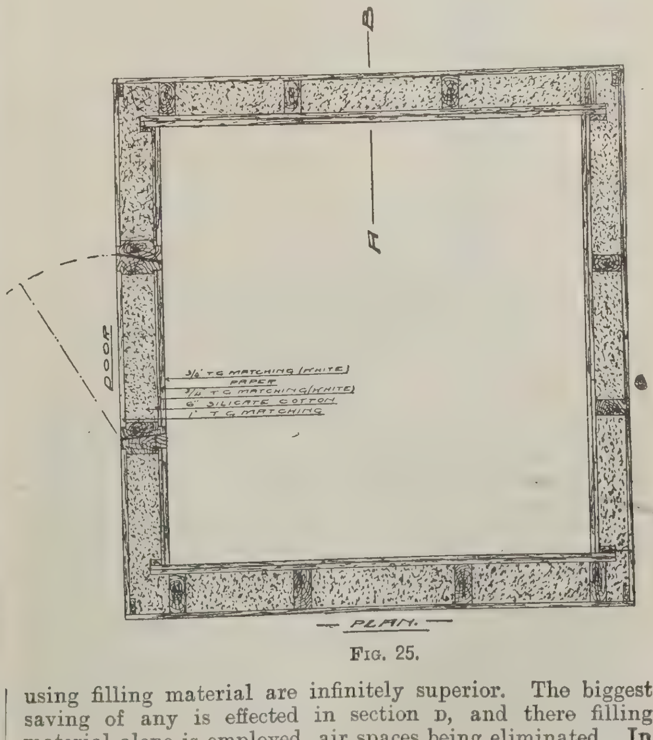

Fig. 25.

Although these figures, owing to the assumptions that have been made, cannot be taken as representing, with perfect accuracy, the actual saving per annum, they are yet fairly near to the mark. The costs have been worked out on actual quotations for timber, filling materials, &c., and an average percentage added in each case for labour and the manufacturer's profit. Moreover, as the same conditions have been assumed for all the different sections, the comparison must be perfectly fair, whether the figures themselves are absolutely accurate or otherwise. That is to say, the proportion existing between the various results holds good, even when the assumptions are changed. In the writer's opinion this way of comparing insulations is the only just one. It is of no use to the practical man to know only the heat leakage which he avoids by making a certain improvement. He must also have a knowledge of what it will cost him, and take account of this expense in appraising its merits.

As to the data in regard to the saving in B.T.U.'s lost, these are taken from tests made by Mr. John E. Starr for the Nonpareil Cork Manufacturing Company, U.S.A. A special room was fitted up for the purpose of carrying out the experiments, and elaborate precautions were taken to ensure accuracy. The results harmonise well with those due to other authorities, and, considering the nature of the apparatus employed, may be taken as being fairly correct.

Coming now to the comparison of the sections, the conclusion which we have to draw is obvious. It is quite clear that, compared with the air space insulation, the sections using filling material are infinitely superior. The biggest saving of any is effected in section D, and there filling material alone is employed, air spaces being eliminated. In section E we have also a considerable saving, although less than one-half of that obtained with D, while two air spaces have been used in addition to the filling. But in sections B and C, composed entirely of air spaces, the economy is either negligible or is actually converted to a loss. It is noteworthy, too, that section C, which gives us the loss, has three air spaces, while section B, showing a bare profit, has only two. It would seem, in fact, that directly we begin to put in air spaces we have a reduction in economy, and, further, that an increase in the number of spaces gradually leads to a loss. The moral of this reasoning is too plain to require emphasis.

In both sections D and E granulated cork has been shown as filling, but with any other good insulation, such as charcoal or silicate cotton, the same economy will be observed. With the last two materials, in fact, the economy would, if anything, be slightly superior, as will be seen by considering the leakage coefficients and costs tabulated in article II. The difference, however, is small, and hence it is not a question, in deciding between these insulators, of expense, but rather one of their individual qualities, such as inflammability, resistance to decay, liability to dampness, &c. These have already been fully dealt with, but mention might also be made of another material, which differs from the others inasmuch as instead of being packed it is applied in layers. This is "Cabot" quilt, made from the intertwined blades of a species of reed which is known as "Eelgrass." It will be familiar to architects in this country more as an efficient sound deadener than as an insulator, but in the States it is used in the latter capacity to a considerable extent. It was also tested by Mr. Starr, the section adopted being composed of four courses of double ply quilt between four layers of $\frac{7}{8}$-inch T. and G. boarding, and the result was a heat leakage of 2.5, showing a very fair efficiency. The cost of the double ply material is 0.87 pence per foot super, and the weight per square foot (the thickness being about $\frac{1}{4}$ inch) .24 lb.

Section D would do very well for partitions, but for the main walls at least 6 inches of filling should be used. In some cases even as much as 9 inches is necessary, the exact thickness depending on the temperature to be maintained in the rooms. For ordinary work, a very good section which has given complete satisfaction in practice is that illustrated in fig. 24. Here it is assumed that the insulation is used as a lining to existing walls, in which case it should be separated from them by a narrow air space, as shown, in order to avoid any risk of the penetration of dampness. Such a section is suitable for storage temperatures from say 28° Fahr. upwards. Below that figure the filling should be increased in thickness. Floors in small rooms need not be different from the walls, with the exception that $1\frac{1}{4}$-inch T. and G. flooring would be used instead of the two layers of $\frac{3}{4}$-inch T., G. and V. matching. The construction of a small chamber on this principle is shown in figs. 25, which give details of the arrangement employed for the rails, studs and plates. It is sometimes advisable, however, to thicken up the insulation on the floor, as it is there that the lowest temperature and consequently the greatest tendency to leakage will be found. In that case 8-inch or 9-inch instead of 6-inch rails would be used.

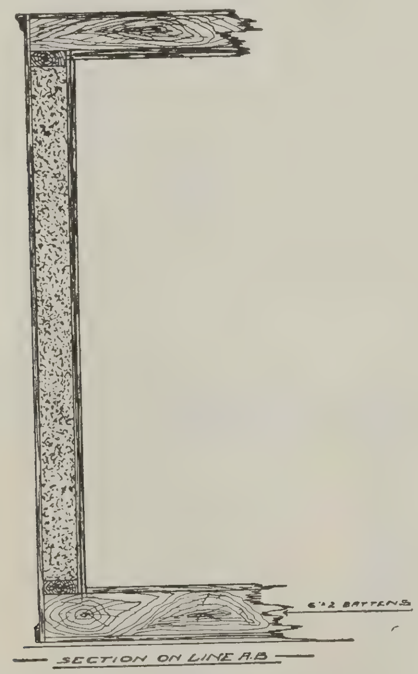

Fig. 25.

## BUILDING BY-LAWS.[*]

One of the most curious results of the continued craze for legislation is to be found in the by-laws which regulate building in so many parts of England at the present day. In attempting to discuss them collectively one is faced at the outset by a difficulty hardly to be anticipated in their diversity, which is so extreme that neighbours living near district boundaries might sometimes as well be living in different countries in respect of any equality of building rights they would be supposed to possess. It is quite a common and yet surely a very unjust state of affairs that a man owning property on one side of a road may only build by permission, under stringent regulations not easy to comprehend, and subject to delays, fees, fines and penalties, while his opposite neighbour may build just as he pleases and, not having the preliminary expenses, the contingent fines and, some would add, the blackmail to pay, is able to build better at less cost. Consequently, those who have the misfortune to dwell or to practice in by-law-beridden districts find it hard to arouse the sympathy of their more fortunate friends who have not been subjected to the annoyance and loss that ignorant petty officialism armed with clumsy but dangerous weapons can inflict. Experience in one district, where the surveyor is an honourable man who has had a proper training and knows how to administer his Council's by-laws with fairness and the minimum of hardship, gives absolutely no guidance as to what is to be expected in another.

The lack of uniformity in the building codes sanctioned by the Local Government Board is the more curious in that they all purport to be cast in the same mould. An examination of sixty odd copies obtained at random discloses the fact that no two are alike throughout, and the examination leaves one in doubt as to which should be taken as the criterion. So far as my present judgment goes, however, for completeness, if somewhat tainted with irrelevancy, no set of by-laws equals that issued by a rural district council whose clerk in response to my application for a copy of their building by-laws, obligingly sent me three pamphlets, one of which dealt with the construction and arrangement of bathing machines and the dress and deportment of bathers. A pamphlet I wrote in 1905 foretold the approach of a time when cricketers would have to get their garments approved by a Flannel sub-committee, and here we have a rural district council already issuing two if not more by-laws dealing with bathing costumes. What this sub-committee is called I dare not venture to suggest, but its rules are not as practical as they might be, for they do not specify fast colours.

Ordinary urban or rural councillors however do not attempt such ambitious flights, but find their desire for variety and originality sufficiently gratified by indefensible departures from the model.

The parent type of all the modern building by-laws is, I believe, to be found in a brief set of "Rules and Directions for Re-edifying the City," embodied in an Act of Parliament passed immediately after the Great Fire of 1666. They are both interesting and instructive. Not only does one find that they give the form to English by-laws of to-day, but they are a product of the same desire that inspired many of the decrees that have regulated building in Paris since the seventeenth century. These decrees are by no means democratic, and it seems strange that even now Paris architects have to comply with several enactments set forth in their code beginning "Louis, king of France, by the grace of God." The fact is that the by-laws of the seventeenth century in England and France were as much by-laws of street design as of building construction, intended to obtain uniformity to certain types of buildings, and considering the street and the terrace rather than the individual needs of the building owners and occupiers, in which respect they anticipate a recent Town-planning Bill.

The present English by-laws aim directly at permanency in building and indirectly at uniformity, for the fact that in pursuing the former without conspicuous success they have to a limited extent achieved the latter by reducing building in some districts to one dull level is accidental though natural. As a means of obtaining durability they endeavour to enforce good construction, but in this they effect but little, owing partly to the non-stimulative influence of restrictions upon experiment, but chiefly because one cannot originate what already exists. Good construction has always been generally aimed at and achieved as far as the knowledge of the period permitted, and it has never ceased and is never likely to cease to be in vogue for the simple reason that it depends not upon legislation but upon an intelligent public demand. In a similar way, stated in different terms, those who framed the by-laws tried to stop bad building, and in that attempt they have to some extent succeeded in the districts—very few, I believe when all is told—where it was prevalent. Jerry-building is an evil which cures itself whether in castles or cottages, motor-cars or perambulators—even in bathing machines—and it is not synonymous with speculative building. The successful speculative builder is the one who builds so that he can sell or mortgage his houses to people who have seen them built; the other sort of speculative builder eventually arrives unaccompanied by much sympathy in the bankruptcy court.

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[*] A paper read before the British Constitution Association on April 25 by Mr. R. M. Lucas, F.R.I.B.A.

Naturally the progress of building is like all other human progress—not always in a straight line. If we could see the whole course of any science in its development and could review it at one glance back to its starting-point, should we not invariably see an irregular, zigzag line, even looped in a return upon itself sometimes, like the track of a sailing ship charted on the ocean?

Probably the most perfect construction the world has ever seen is to be found in the trabeated buildings of ancient Greece, notably the Parthenon, considered in this connection without regard to its exquisite refinements of design. Yet the Romans, though retrograding in respect of minute accuracy and skill of workmanship, made an unquestioned advance in another direction with the arched construction which so enlarged the scope of architectural energy. Experiment, variation, advance—so it has always been and will be as long as men retain a trace of individuality and freedom to exercise it.

Ever since human beings lived in caves—and in these days of electric light, forced ventilation, tube railways and flying machines we may again see them described as eligible residences—there has been a steady increase in the amenities and comforts of the home, and it is obvious that the appreciation of them would beget a desire to preserve them. Thus began the necessarily slow, because empirical, search for durability. The three great forces to be contended with were, and still are, fire, tempest, and decay, and the resistance offered to them found itself in good material and sound workmanship. These three forces, broadly speaking, explain to us the whole history of construction.

But with the demand for improvements in building there must have grown up, long before men were conscious of it, a desire for conditions that conduce to health—in one word, sanitation. These conditions were for centuries only dimly observed by the survivors under Nature's stern administration of the law of extermination of the least fit. Men who lived in caves gave place to men who lived in the light and air. The association between dirt and disease became apparent, and comparatively recently people have become aware of the relationship of darkness to both. Instincts of time-lost origin, making for cleanliness, are now endorsed by science, and homes that can be kept clean, fresh and bright are more and more sought after. Herein we have the development of sanitation.

These two great aims of home-builders, good construction and sanitation, are of remote antiquity, and even when unrecognised have never been absent, and they still beckon us onward, demanding an advance we can only make if we have freedom to experiment and vary, to test, to reject, and to accept.

Good construction and sanitation, however, though they go hand in hand, differ radically in one respect, even if good construction be expressed otherwise as the avoidance of bad construction. Construction is the almost exclusive concern of the building owner; but sanitation is never that, it must always be partly at least the concern of the community.

It is important to bear this general distinction in mind, for it helps us to see through the confusion that exists between the constructive and the sanitary by-laws, a confusion unhappily engendered by the way in which the various Acts have been drafted. It would have been well if the two subjects had been separated, but as they were combined in the City of London Re-edifying Act of 1666, the custom of treating them as of the same nature is sanctioned by long use. That Act, being germane to my subject and of considerable interest, I venture to quote briefly in outline.

It begins by enacting "That there be only four sorts of buildings, of the dimensions that appear in the annexed table. The first, or smallest sort, to be erected in by-lanes, to be of two storeys high, besides cellars and garrets; the second sort, to be built in noted streets and lanes, to be of three storeys; the third sort, to be erected in the high and principal streets, to be of four storeys, with balconies before the same; and the height of the fourth or largest sort, for mansion-houses for the principal citizens and persons of quality (not fronting the street) to be at the discretion of the builder, provided it does not exceed four storeys."

The Act continues:—"That all new buildings are to be built with stone or brick, not only for beauty and duration, but also as a fence against fire."

Its third paragraph is "For the more effectual preventing of the citizens being imposed upon . . . in case of any combination, or exaction, by brick or tile-makers, lime-burners, carpenters," &c., and generally provides for the prevention of what are now known as "rings" and "strikes."

The fourth paragraph deals with privileges of workmen; the fifth with the widening of streets; the sixth with compensation to freeholders; the seventh, which I fear we are all guilty of disregarding, ordains an anniversary fast, or day of humiliation to be annually kept on the second of September as a perpetual memorial of the conflagration—our ungrateful by-laws do not even mention this; the eighth enacts that "a column of brass or stone should be erected on or near the place where the said dreadful fire unhappily began"; the ninth deals with the formation of a riverside wharf; and the tenth and last with an import tax of a shilling a ton on coal. Then follows the table mentioned in the first paragraph.

This table, the foundation as I believe upon which all our modern building by-laws, both constructive and sanitary, are based, groups its clear and fairly comprehensive regulations under six headings.

The first heading is "A plan of dimensions," &c., and it gives heights of rooms, and thickness of external walls and party walls. The second and third headings are "Scantlings of timber for the first sort of houses"; and "Scantlings of timber for the second and third sort of houses"; the fourth, fifth and sixth headings, applying to all sorts, give scantlings for timber and laths, for stone piers, &c., and for sewers.

As a specimen of these regulations, I quote the following, applying to houses of the first, the smallest, class, to be erected in by-lanes:—

Height of storeys:—Cellars, 6 feet 6 inches; first storey, 9 feet; second, 9 feet; garrets, no height given. All through the table garrets are put down with two noughts in the feet and inches column, but this implies only that roofs sloped at various angles, not that occupants of garrets had but the two dimensions of length and breadth without height. It is to be observed that the dimensions are not minimum but absolute, obviously intended to produce uniformity in terrace elevations, and thus distinctly "town-planning" in character.

Thickness of front and back walls:—To the first floor, two bricks, that is, an 18-inch wall; to the second and third a 14-inch wall; to the garrets a 9-inch wall.

Thickness of party walls:—To the first, second and third floors, 14-inch walls; to the garrets 9-inch.

These dimensions are more substantial than those required under modern by-laws, and the party walls for two storeys had to be as thick as the external walls, whereas now they need only be two-thirds the thickness.

Under the next heading we have the following scantlings (the breadth and depth of timbers) up to a length of 15 feet:—Summers or girders, 12 inches by 8; wall plates, 7 inches by 5; joists, 3 inches by 7; joists for garrets, 3 inches by 6; principal rafters at the foot, 8 inches by 6; at the top, 5 inches by 6; single rafters, 4 inches by 3.

For the second and third sort of houses, other timbers are specified in addition to these: rising pieces, beams, lintels and purlins, with their appropriate scantlings.

The next heading gives scantlings for sawn timber and laths:—Single quarters, 8 feet long, 3½ inches by 1¾; double quarters, the same length, 4 inches by 3½; joists, 8 feet long, 6 inches by 4; laths, 5 or 4 feet long, 1¼ inch by ⅜ of an inch.

Except those of the joists, which show that the relative supporting strength of depth and thickness had only been partially grasped, the dimensions given are practically those of to-day.

Stonework dimensions are then laid down:—Corner piers, 18 inches square; single piers, 14 inches by 12; double piers, 14 inches by 18; door jambs and heads, 8 inches.

Then last of all comes the solitary reference to sanitation. Sewers being 3 feet wide and 5 feet high, were to have walls a brick and a-half thick, to be arched over with bricks set on end, and to be paved with "one brick sideways, laid circular."

A few months later, in April, 1667, this re-edifying Act was supplemented by an Order made by the Lord Mayor, Aldermen and Council, beginning—"It is ordered that the surveyors take special care that the breast-summers of all houses do range of an equal height house with house, so far as shall be convenient and there to make breaks by their directions.

"And that they do encourage and give directions to all builders for ornament sake, that the ornaments and projections of the front buildings be of rubbed bricks neatly wrought, or all rubbed at the discretion of the builder, or that the builders may otherwise enrich their fronts as they please."

In the King's Declaration upon the Great Fire, notice is taken of "the pernicious consequences which have attended the use of building with timber or even with stone itself, and the notable benefit of brick," and to build with timber in the City was henceforth forbidden absolutely.

The table which I have quoted and the brief recommendations could be printed on an ordinary sheet of notepaper, and these regulations sufficed to control the rebuilding of the heart of the greatest city in the world.

It is instructive to compare these short and effective by-laws issued to cope with an emergency, the like of which has never since occurred, with the 139 by-laws that regulate building in the rural district of Farnham, or with the illustrated volumes of 150 pages or more issued in some boroughs and urban districts, and to compare further the state of those districts with that of others which thrive and prosper without ever having had any building by-laws at all.

The by-laws under which the City of London was rebuilt have taken but a few minutes to quote, but time would by no means permit of the quotation of the present-day by-laws even of a remote village—not to mention the London Building Act. I have, however, collected for comparison some few facts by a wearisome examination of over sixty codes framed on the same model but without the least uniformity of arrangement, the majority being without indexes, marginal references, or paragraph headings. It really seems as though those who are responsible for the by-laws were determined to make them as obscure and difficult of reference as possible. Indeed, I once heard a town clerk tell his committee, "There are objections to an index." To a bad index, perhaps; but surely not to a good one. The remark can only have meant that if an index were supplied it would probably resemble others in being so inaccurate and incomplete as to be a snare and a hindrance.

I mentioned a lack of uniformity, but in one respect the codes are terribly uniform. Nearly every clause, instead of beginning with some noun or verb that would indicate the subject, begins with the words, "Every person who shall erect a new building." For those whose duty it is to hunt for hidden prohibitions through the regulations of various districts, this concealment of the subjects means a surprising amount of extra labour.

Nor is reference facilitated by the fact that the sequence of subjects in one code is seldom, if ever, the same in another. For instance, by-law No. 11 in Okehampton is No. 59 in New Winchester, 12 in Hitchin, 49 in Godstone, 17 in Amersham, 29 in Gloucester, 66 in South Stoneham, 58 in Farnham, 57 in Dursley, 64 in Hendon, and 69 in Blackburn rural districts. It is certainly No. 11 also in Alresford, Penrith, Pembroke, and other places; but then the 38th Okehampton by-law is No. 40, 41, and 39 respectively with them.

This Okehampton by-law No. 11 requires certain ventilation flues. In Gloucester the minimum size for them is 50 square inches; in Dursley, in the same county, 100 square inches. One size is wrong, but which? And is either right?

Among urban and rural districts that index their by-laws are the following:—Portsmouth, Aylesbury, Winchester, Southampton, West Ham, Farnham, and Eton; and among those that do not are Blackburn Rural District, Bournemouth, Penrith, Yeovil, Bodmin, East Westmorland, and Lymington. Blackburn borough by-laws have the sort of index the town clerk whom I quoted must have had in his mind—a non-alphabetical table of contents.

Bournemouth, Portsmouth, and Blackburn embellish their codes with explanatory diagrams, but their example is seldom followed.

The Windsor Rural District Council charge 2*s.* 6*d.* for their by-laws; Guildford, 1*s.*; Aylesbury, 7*d.*; Petersfield, 6*d.*; South Stoneham, sometimes 6*d.*, sometimes nothing. The majority make no charge.

Amersham, Bodmin, Hendon, and a few other councils provide fairly full marginal references; Blackburn Rural District and Godstone do so but stingily; while most of the codes are lacking in these obvious conveniences.

About half the rural districts have by-laws relating to the general construction, height, and thickness of walls, Godstone, for instance, rejoicing in seventeen pages of them—enough, one would think, to regulate the building of a new Tower of Babel. In Dursley, however, they only provide for heights up to 60 feet—no sky-scraping labourers' cottages there! The remaining districts have no such rules, and presumably do not need them.

(*To be concluded.*)

## ART EXHIBITION.

At the Leicester Galleries, Leicester Square, W., there are now on exhibition about forty paintings in oil and watercolour upon which Mr. Charles Sims, A.R.A., has been engaged during the last four years. The collection includes finished sketches for his "The Land of Nod," "An Island Festival," and "The Fountain," all of which aroused great admiration—it might almost be said that they made a sensation—at the time of their exhibition on the staid walls of the Royal Academy. This does not mean to suggest that this young Associate is at war with Burlington House traditions, but merely that his pictures have qualities rarely found there. In this connection it is useful to recollect that Mr. Sims commenced his art training in 1890 at South Kensington; he then joined the Académie Julian in Paris, where he worked under M. J. Lefebvre and M. Benjamin Constant, and finally was at the R.A. schools. It would appear as if the French influence made an indelible impression on his work. The pictures now exhibited, though of a variety of subjects, are all viewed through the same poetic glass. For example, we may take Nos. 10 to 14. The first is "Gipsies," though the interest of the picture is centred not in a small encampment in the lower foreground, but in the glorious stretch of open (Sussex) country towards which the gipsies are looking. No. 11, "Child Worship," is obviously, from its title, a flight into the poetic. The same instinct is in No. 12; yet "Washerwomen," busy in a garret, is prosaic enough to most eyes. "The Quarry" (No. 14) is a hunting scene, where a stag is brought to bay by incorporeal shapes armed with bows and arrows. The same fanciful spirit breathes through these and all the other works; happily it is reinforced by powers of execution fully equal to the conception. There is a variety of treatment also which holds out the greatest promise for the future. A steady output of even such works as "The Fountain" would perhaps become in time cloying. Fortunately the same hand has produced "The Heather Crown," "Sap," and "The Astrologer and the Witch." Mr. Sims has come to be looked upon as one of our leading men; the present exhibition will enhance his reputation.

## ILLUSTRATIONS.

### LIVING ARCHITECTS.—NO. 34, MR. J. J. BURNET, A.R.S.A., F.R.I.B.A.

Mr. Burnet is a representative Glasgow architect, and is known to Southerners as the selected architect for the extension of the British Museum and an active member of the Council of the Royal Institute of British Architects.

### NO. 35, MR. W. FLOCKHART, F.R.I.B.A.

Mr. Flockhart is a past member of the Council of the Royal Institute of British Architects, and has distinguished himself in some of the recent principal open competitions as well as by his domestic work.

### CLYDE NAVIGATION TRUST, GLASGOW.

As examples of the work of Mr. Burnet we illustrate some views of the interior of the office building of the Clyde Navigation Trust.

Messrs. Read & Waring, civil engineers, Westminster, have been instructed by the Berwick Town Council to prepare a scheme of water supply for Tweedmouth and Spittal.

The directors of the Stirling Royal Infirmary have resolved, owing to the 12,000*l.* asked for to make a large extension to the infirmary building not having come in, to proceed at present with a new wing to cost 4,300*l.* The smaller scheme will fit in with the larger proposal, for which it is hoped the money will yet be obtained.

The University of London has arranged an advanced course of lectures, to which admission is free, on "The general principles of waterworks engineering, with special reference to the mechanical filtration of water," by Mr. W. H. Maxwell, A.M.I.C.E., at the University of London, South Kensington, S.W., on Fridays, May 6, 20 and 27, at 6 p.m. No tickets required.

## THE CONCRETE INSTITUTE.

The ninth ordinary general meeting of the Concrete Institute was held at the Royal United Service Institution, Whitehall, London, on Thursday, April 21, when a paper on "The Effects of Sewage and Sewage Gases on Portland Cement Concrete" was read by Mr. Sidney H. Chambers, engineer and surveyor to the Hampton Urban District Council.

The subject of the communication, the author stated, was one in regard to which it might be assumed that the available evidence was either inconclusive or of a more or less negative character; for, notwithstanding that cases were on record of destructive changes in tanks and sewers, the opinion tended to prevail that when the concrete construction was sound no marked disintegration need be anticipated, neither from sewage nor from its emanations.

The author's experience, however, did not support this view, and it was to the elaboration of this, the positive side of the question, that he desired to direct attention. During the last five or six years he had had very special opportunities for studying the problem.

In order to be in a position to more fully appreciate the disintegrating changes occurring at Hampton, and the deductions drawn from them, the author described briefly the installation in question, and stated the character of the sewage as well as outlining the nature of the materials used in the construction of the tank and channels.

### *The Hampton Installation.*

The nature of the sewerage system was water carriage, primarily flowing by gravitation, and, secondarily, raised by plenum pneumatic power. The sewerage was entirely and completely on the separate system. The installation consisted of a screening chamber, two detritus tanks, a hydrolytic tank, and triple contact beds, and an air purifying filter.

The sewage on its arrival at the works was delivered from the rising main into the screening chamber, and after passing through the screen was conveyed by a channel to the detritus tanks. From these tanks the sewage entered the hydrolytic tank, which, together with the detritus tank, was installed in 1903. The disposition of the tank was such that the main bulk of the sewage—80 per cent.—passed through at a comparatively high rate of flow, issuing in four hours as a clarified liquid, whilst the small volume—20 per cent.—containing the deposited matters was sixteen hours in the tank. After flowing over the weirs of the first portion the liquid entered a channel which led to the second portion of the tank, consisting of four hydrolising chambers arranged in sequence and filled with large flint stones. The liquid having taken three hours in its passage through these four chambers, entered the lower channel, which conducted it to the contact beds.

The screening chamber, the tank, and the channels leading to and from the tank, as also the effluent channel of the primary contact beds, were covered in. The entire installation was ventilated by the hydro-mechanical system of sewer ventilation, and the withdrawn gases were purified by being passed through an air filter.

The sewage of Hampton was of a strong domestic character. It had undergone thorough disintegration by the lifting operations and by the putrefactive changes occurring in the rising main. It was malodorous on its arrival at the screening chamber, where, as it left the rising main, it evolved sulphuretted hydrogen and other bad smelling compounds. The liberation of these gases constituted a nuisance, necessitating the screening chamber, channels and tank being covered in and a means being provided for drawing a large volume of air through them before discharging the gases into the atmosphere.

The whole of the tank and channels were constructed of Portland cement concrete. The walls of the tank are 6 feet 6 inches in thickness at the base and 1 foot 6 inches at the top, and are strengthened by tie-rods; the roof was 6 inches in depth, and was reinforced by "expanded metal," and the channels were covered by 2-inch "Indurated" paving slabs. The work was executed by departmental labour, and the best materials were used.

The concrete was composed of one part of Portland cement properly mixed with clean water and six parts of ballast thoroughly free from loam, clay, mud, or dirt of any kind, and no material was allowed to be used larger than would pass through a 2-inch screen.

The makers of the "Indurated" paving flags state that they are composed of Mountsorrel granite chippings, washed and crushed to pass through a ¼-inch mesh sieve, and heavy Portland cement made by themselves, the raw material for which is obtained from the Barrow-on-Soar blue lias beds. The materials are mixed in the proportion of one part of cement to three parts of granite.

### *Efflorescence.*

Early in 1905, a few months after the hydrolytic tank had been put into use, it was noticed that the roof and walls of the hydrolysing chambers above the liquid level were white or yellowish in appearance. This efflorescence was not crystalline in structure, but was of a chalky subsistence, and resembled distempered work on a damp wall. On examination it was found to be due to a thin covering of sulphur, which could be easily removed by rubbing. Later the face of the walls and the roof in the second part of the tank showed signs of peeling, and the concrete appeared to be disintegrating. A thorough inspection of the installation was thereupon made.

### *Disintegration.*

At the screening chamber nothing appreciable was observed, neither at the highest water-level nor on the underside of the roof. The concrete was sound, and when struck had a good ring. Immediately adjoining this chamber was the main sewage inlet channel, along which the whole of the gases pass to the main air duct leading to the air filter. At this point slots were made in the concrete to receive a dam; the concrete at the back of the grooves was found to have disintegrated, although the sides were perfectly sound.

Further along this channel it was observed that the greatest disintegration had taken place on the walls at the liquid level. Owing to variations in the flow of the sewage, the level of the liquid in the tank and channels rose and fell; thus a certain area of the walls was constantly being immersed in the sewage and then exposed to the air. This area was consequently, even when not immersed, much wetter than the part of the walls which was always above the level of the liquid. The latter area at this point showed erosion, which, however, had not penetrated so deeply as that at the level of the liquid itself. At the liquid level there was a deep groove in the concrete, and above this the face of the work had bulged out and lost its nature.

The first portion of the tank—*i.e.* the hydrolytic tank proper—appeared to have suffered very little. The walls and roof had only the slight sulphur deposit. At the liquid level, which varied less than in the channel, there was a slight erosion. The second part of the tank—*i.e.* the hydrolysing chambers—was found to have suffered in places to a marked degree. It was observed on breaking through the erosion on the surface that the concrete at the back was moist, soft and gritty. Also it was noticed that increased dampness constituted an important factor in the destruction of the concrete, for the lower parts of the vertical faces of the beams supporting the roof were more affected than the upper parts. The lower portions of the vertical walls of the tank also were more eroded than the upper. At the liquid level the concrete had been severely attacked, and a deep groove existed in it.

### *Analyses of Concrete in Hydrolytic Tank.*

Two samples of surface concrete were taken above and below the liquid level, and the following was the result of the analyses:—

| | Below Liquid Level. Sound. | Above Liquid Level. Unsound. |
|---|---|---|
| Appearance ... ... ... | Grey | White |
| Texture ... ... ... ... | Hard | Soft |
| Ratio cement to sand ... ... | 1:2 | 3:2 |
| Sulphate of lime in cement ... | Trace | 66 per cent. |

### *Considerable Deterioration.*

The same pronounced effect was to be seen in connection with the concrete blocks, which were grooved to receive sliding boards and project above the liquid level; these blocks had in many instances crumbled away to such an extent as to be almost shapeless. Recently these chambers were emptied, and it was found that the concrete below the liquid level was perfectly sound and in a good state of preservation.

The lower channel conveying the liquid from the tank to the contact beds revealed the same characteristics as were observed in the upper channel, but the portion at the liquid level was very much more markedly affected.

### *Analyses of the Disintegrated Concrete in the Channels.*

Samples taken of the lining of the sides and covering gave the following analyses:—

| | Ratio. | | Sulphate of Lime in Cement. |
|---|---|---|---|
| | Cement. | Sand. | |
| 1. Concrete at varying liquid level | 1 | 1 | 70.26 per cent. |
| 2. Underside of slab forming covering . . . . | 5 | 1 | 74.61 per cent. |

The air duct taking the gases from the effluent channel of the primary beds and communicating with the tank outlet channel was found to have a coating similar in appearance to that observed on the underside of the covering to the channels.

*Analyses of Concrete in Air Duct.*

Analyses of this coating were made, with the following results:—

|  | Ratio. |  | Sulphate of Lime in Cement. |
|---|---|---|---|
|  | Cement. | Sand. |  |
| Underside of slab forming covering of air duct . . . . | 2 | 1 | 70.71 |

*Conversion to Sulphate of Lime.*

The point to observe in the above analyses was the conversion of the lime in the cement into sulphate of lime, the sulphur being obtained from the sewage flowing through the tank and channels, as well as from the gases expelled from the sewage, and contained in the air withdrawn from the several parts of the installation.

*Suggested Explanation.*

Much thought had been given to the explanation of the foregoing observations, and it had been concluded that the effects had arisen from the putridity of the sewage and the oxidation of the putrid products by the air supply. The main erosive effect was at the varying liquid level, and was there dependent upon the amount of sulphuretted hydrogen in solution in the liquid. The gas was comparatively small in amount in the incoming sewage and in the liquid in the hydrolytic tank, and increased as the liquid passed through the hydrolising chambers. The results of this were especially well shown in the two channels: the alternate wet and dry area of the upper channel conveying the sewage from the rising main was less markedly affected, whilst in the lower channel the corresponding area was severely attacked. So with the two parts of the tank; the first part into which the sewage was delivered, and wherein comparatively little putrefaction took place, had not been affected to anything like the extent that the second part or hydrolysing chambers had.

When the level of the liquid fell it left the concrete which it previously covered wetted with a liquid containing sulphuretted hydrogen in solution. This wet surface was then exposed to the action of the air supply, which oxidised the sulphuretted hydrogen with the production of sulphur and sulphuric acids; these decomposed the concrete, the lime being converted finally into sulphate of lime. What the exact nature of the intermediate compounds was could not be stated, as none of them had been isolated, but it was probable that the active agent was sulphurous acid, as it was known that cement was insoluble in sulphuric acid. When the liquid rose again, the decomposed concrete was washed away either wholly or in part, and a fresh surface was exposed to action when the liquid fell again. It was the continuation of this cycle which led to the formation of the grooves at the varying liquid level.

*Concrete above the Liquid Level.*

The erosive effects on the concrete above the liquid level were dependent upon the sulphuretted hydrogen evolved from the liquid and mixed with the air supply. Some of this gas was dissolved by the moisture which was present on the walls and roofs, from evaporation and condensation; it was then oxidised by the air, and decomposed the concrete as described above. In this case the decomposed concrete either remained as a coating on the surface, peeled off, or crumbled away.

*Effect on Concrete Tubes.*

In order to observe the phenomenon on concrete tubes, two 9-inch concrete tubes were selected, which were supplied by the makers of the paving slabs previously referred to, and were composed also of similar materials in the same proportion. One of the tubes was coated with Dr. Angus Smith's composition (coal-tar, pitch, linseed oil, and resin). They were placed side by side in the second part of the tank in such a position that they would be subjected to the rise and fall in the level of the liquid. At low level the tubes were not in contact with the liquid, and at high level the liquid rose to half the diameter.

After the tubes had remained in the tank for eight months they were taken out and examined. The coated tube did not appear to have been affected, other than at the highest liquid level, where a thin line could be observed, and when struck it was found hard and had a good sound. It was noticed that there were two areas on this tube without any coating, due no doubt to its having been placed upon two supports to allow it to dry; these areas were soft on the surface and similar to the uncoated tube. With these exceptions the tube appeared to be in as good a condition as when first placed in the tank. On the other hand, the uncoated tube had a distinct line at the highest liquid level, which was found to be soft, and when tapped with a chisel had a dull sound; the interior of the tube which had been immersed appeared soft and had a dull sound when struck; the portion of the tube above the liquid level was unaffected, and when struck had a clear ring.

The author then referred to other cases of disintegration of concrete by sulphur compounds.

*Conclusions.*

The deductions to be drawn from the investigations were that the gases in solution in sewage, and those expelled from it, arising from its decomposition, do act injuriously upon Portland cement concrete, notwithstanding the fact that the concrete is constituted of sound and good materials, when the following conditions prevail:—

1. A high degree of putrescence of the sewage.
2. A moistened surface, which held or absorbed the putrid gases.
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Further, that in the absence of one or other of the above enumerated factors little danger from erosion need be feared.

Letters were read from Mr. H. K. G. Bamber, of the Associated Portland Cement Co., Ltd., and Mr. A. E. Collins, M.Inst.C.E., Norwich. Mr. Bamber said that in the main he was in accord with the author as to the probable cause of the defects discovered in the concrete being the action of sulphur compounds, although there may be some doubt as to the precise action which takes place. In his opinion a fairly warm temperature and moist atmosphere is necessary to produce the results stated by Mr. Chambers—*i.e.* the conversion of sulphuretted hydrogen into the sulphuric acid. Mr. Bamber said that the author's statement in this connection that cement is insoluble in sulphuric acid was not quite in accord with the previous statement that the sulphurous acid decomposes the concrete. Cement in the form of calcium hydrate, in which it largely exists in concrete, is soluble in sulphuric acid, the suggestion that it is not being simply due to the fact that during the action of sulphuric acid on the lime calcium sulphate is formed which collects over the surface particles of calcium hydrate to be dissolved, and prevents the further contact with sulphuric acid. Calcium hydrate continually agitated with sulphuric acid is soluble in that reagent. It is possible, continued Mr. Bamber, that the reaction may be brought about also by the combination of the sulphuretted hydrogen with the lime of the concrete forming calcium sulphide which is oxidised to calcium sulphate by the air passing through the culverts, and in either case the result is a loose friable material which is washed away by the passing fluids, again exposing a further surface for such decomposition. The remedy for this seemed in Mr. Bamber's opinion to be in the formation of an absolutely impervious and smooth surface on the inside of the culverts. In this connection he mentioned that his company are at the present moment engaged in experimental work with a special preparation of Portland cement to be used for this purpose. He was hopeful that in this way defects such as have been described by the author, and which may have been brought about by some special circumstances, may be entirely avoided. Mr. Bamber said he recently had an opportunity of inspecting some of the main sewers of Paris lined with Portland cement, which show no such deterioration. He therefore thought that Mr. Chambers's experience in this connection for some reason was somewhat unique, and must have resulted from special circumstances, as such defects are not general in sewer work constructed with Portland cement concrete.

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The discussion was continued by Mr. D. B. Butler, Mr. A. C. James, Mr. W. G. Kirkaldy, Mr. E. P. Wells, Mr. Herbert E. Brooks, and Mr. W. Dunn, F.R.I.B.A., chairman.

A vote of thanks having been passed, Mr. Sidney H. Chambers replied briefly to the discussion and stated that he would deal at greater length in the Institute's proceedings with those or any other points raised.

## ART ARCHITECTURE AND THE ASSISTANT.*

THE first glimmer in the official mind of the existence of the architect's assistant, as we know him, was exhibited in the address of Mr. Walter Cave at the Architectural Association nearly two years ago, and the measures taken by that body in reference to the state of unemployment, as exhibited by their register, indicates the desire for protection so widespread in the profession at the present time, and of which the measures taken by the Royal Institute cannot be too generously praised. But, previous to Mr. Cave's address, and since, the official view of the assistant as a person of private resource apart from the salary he receives for his work, has been the predominant one. In listening to presidential addresses one after another, one wonders whether presidents live in another world, whether their productions in this direction are intended as an impertinence, a gross piece of sarcasm by tacit inference to their audiences, who principally consist of the struggling assistant who often finds it a matter of difficulty to pay his annual subscription, or, thirdly, whether the assistant is considered so unimportant as to deserve no recognition from the presidential point of view, except as a student.

From the position of the assistant as student there is much to be done, and the existence of a large class, much larger than one would suspect, wretchedly paid, quite unrepresented in any society, and having no means whereby their position may be bettered, the existence of this class, I say, is a standing menace to the profession as it concerns the assistant, for it means the lowering of salary and status of the better men and more casual employment. The existence of many offices where men of this class are employed at insignificant salaries, with a paid assistant brought in at intervals to perform any thoughtful work, tutor the pupils and backward assistants, and then politely dismissed when the term of his usefulness is past, is no uncommon experience, and one which has been politely waived aside by official opinion. As a student, the assistant has always been interested in matters of art, and especially in relationship to his profession. From the point of view of individual development, the study of art is essential; but art in relation to the assistant and to our profession as matters stand at present is besmirched with cant and hypocrisy. One cannot but regard the manner in which the cant of art has grown up in our profession as one of the most important signs of the times, whereby the selfish business man talks insincerely of art in order to dupe his sincerely artistic *confrères* to achieve his real aims; those aims, of course, being those of any other profession or business devoid of any factor appealing directly to the emotions, as art appeals to any architect who sincerely believes and practises the Mistress Art.

The assistant, of course, has only the full opportunity of showing his knowledge of the art of architecture when either the cunning, carelessness, laziness, or lack of ability of his principal will allow—a condition of things which often prevails, and very largely in public offices where an engineer often reaps a harvest of praise and prestige from the work of an unheard-of architectural assistant. Art itself appears to have reached a precarious stage in the profession of architecture. The disciples are busy imitating and collecting from the masters, and the masters are busy in an ostensible game of bluff—that of imitating themselves; so that the final result of the latter's work is little above the average of their disciples.

To describe the present position of the profession of architecture towards art as that of a mere superficial relationship will probably honestly astonish a few, disgust many, and be looked upon as the idle prattle of an imbecile by many more. To describe that relationship as suspiciously dishonest is probably much nearer the truth, and to frankly describe it as dishonest is more probably the expression of outspoken sincerity. The many points of view as to the relationship of architecture to art agree in those well-known aphorisms so dear to some of us, architecture "The Mistress Art," "The Mother of all the Arts," "Architecture not a Profession but an Art." Most of us have heard these well-worn words so many times that, had we no genuine basis for our belief in them, the mere repetition would have engendered it. The purely artistic phases of the profession, Grand Manner or No Grand Manner, Decorated Construction or Constructed Decoration, are gradually being narrowed to the position the question of religion popularly occupies. If we are Methodists we buy our bread from a Methodist baker, and if we are Calvinists we feel intense remorse on purchasing goods sold by a grocer who contemns the Five Points. Likewise the Grand Manner disciples gaze with silent disgust on the followers of Mr. Baillie Scott. All this is very pleasing and amusing, but its economic aspect as affecting the assistant is scarcely worth any further reference except in a very few exceptional cases. The most noticeable feature of many of the ardent and talkative adherents of any of the schools of architecture is, that if their principles differ, their work has much in common, and usually finds an ample shelter under the title "early Victorian."

As all true camp followers of the art of architecture, the members of this Guild of Assistants duly subscribe to the common declaration of faith which we continue to recite with all due solemnity as our professional fathers have taught us. We do not desire to drag the art of architecture from the high place it occupies, or to trail even the hem of the garments of the Mistress Art in the dust. One would have thought that the position of the art of architecture was sufficiently well-established to resist the breath of scandal from any quarter, but it has ever been a commonplace that the gods should be strictly respected and protected in their implied sufficience from blasphemous influence. We are not deeply concerned in this table talk of architecture, and as a Guild of Assistants we desire to study the profession of architecture as it really is, and to discover the sources of the evils we know and feel the effects of. Let us leave for a moment the attractive thesis of the art of architecture and examine the less attractive but more engrossing one of the

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* A paper read by Mr. E. J. Dixon, A.R.I.B.A., at a meeting of the Guild of Architects' Assistants on April 18.

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The assistant, of course, has only the full opportunity of showing his knowledge of the art of architecture when either the cunning, carelessness, laziness, or lack of ability of his principal will allow—a condition of things which often prevails, and very largely in public offices where an engineer often reaps a harvest of praise and prestige from the work of an unheard-of architectural assistant. Art itself appears to have reached a precarious stage in the profession of architecture. The disciples are busy imitating and collecting from the masters, and the masters are busy in an ostensible game of bluff—that of imitating themselves; so that the final result of the latter's work is little above the average of their disciples.

To describe the present position of the profession of architecture towards art as that of a mere superficial relationship will probably honestly astonish a few, disgust many, and be looked upon as the idle prattle of an imbecile by many more. To describe that relationship as suspiciously dishonest is probably much nearer the truth, and to frankly describe it as dishonest is more probably the expression of outspoken sincerity. The many points of view as to the relationship of architecture to art agree in those well-known aphorisms so dear to some of us, architecture "The Mistress Art," "The Mother of all the Arts," "Architecture not a Profession but an Art." Most of us have heard these well-worn words so many times that, had we no genuine basis for our belief in them, the mere repetition would have engendered it. The purely artistic phases of the profession, Grand Manner or No Grand Manner, Decorated Construction or Constructed Decoration, are gradually being narrowed to the position the question of religion popularly occupies. If we are Methodists we buy our bread from a Methodist baker, and if we are Calvinists we feel intense remorse on purchasing goods sold by a grocer who contemns the Five Points. Likewise the Grand Manner disciples gaze with silent disgust on the followers of Mr. Baillie Scott. All this is very pleasing and amusing, but its economic aspect as affecting the assistant is scarcely worth any further reference except in a very few exceptional cases. The most noticeable feature of many of the ardent and talkative adherents of any of the schools of architecture is, that if their principles differ, their work has much in common, and usually finds an ample shelter under the title "early Victorian."

As all true camp followers of the art of architecture, the members of this Guild of Assistants duly subscribe to the common declaration of faith which we continue to recite with all due solemnity as our professional fathers have taught us. We do not desire to drag the art of architecture from the high place it occupies, or to trail even the hem of the garments of the Mistress Art in the dust. One would have thought that the position of the art of architecture was sufficiently well-established to resist the breath of scandal from any quarter, but it has ever been a commonplace that the gods should be strictly respected and protected in their implied sufficience from blasphemous influence. We are not deeply concerned in this table talk of architecture, and as a Guild of Assistants we desire to study the profession of architecture as it really is, and to discover the sources of the evils we know and feel the effects of. Let us leave for a moment the attractive thesis of the art of architecture and examine the less attractive but more engrossing one of the profession of architecture. The principal and the assistant of fifty years ago might be described as standing on the same plane as regards rank and social position, and in a relationship somewhat of tutor and pupil, the latter being practically certain, if he persevered, of reaching the same, or perhaps a higher, position in the profession than his tutor. It is not implied that the service of architecture was entirely the object, for many of the older practitioners have left some goodly sums of money, as we all know, penuriously amassed in the service of architecture. The advent of the modern assistant, a man with little or no financial backing and depending solely on his salary to live, was gradual; but eventually he numerically swamped the older class, and often proved himself more capable. He immediately endeavoured to imitate the older men—he adopted their superstitions, their habits, and their prejudices. This kind of thing is not, of course, unknown in other walks of life, it is a common social phenomenon. The difficulties of any new movement on behalf of any section have, as their initial difficulty, their first obstacle, the prejudices borrowed from the social strata immediately above, and the question of their removal. The architect's assistant of the present day quickly found himself in the same position as the wage-earners in any other business, and due to precisely the same causes. He has hitherto found his prejudices too strong to permit him to combine in his own interests, to recognise, in short, that his position as assistant is rapidly becoming a permanent one, that the possibilities of becoming a principal grow less as he grows older, that signs are not wanting that the principal means of outlet for the energies of the assistant, the opportunity that this profession possesses above all others, the open competition, is gradually becoming limited, either to districts and more often to architects in practice. I do not think that in thus rapidly sketching the latter history of the architect's assistant I have in any way overdrawn the real state of affairs in the profession as it concerns him. Once granting the truth of this account of the present position of the architect's assistant, it would appear that the only common-sense course to adopt, if no escape from the profession is available, would be to render it as congenial as possible; to recognise the probable limitations of one's genius without attempting to render null and void any ambition one may possess. The first point to be noticed in assuming this view of the architect's assistant's place in the profession is the fact that nothing definite can be achieved without organisation of some kind or other, and the painful fact that the existing societies are composed of principals or those who are in full possession of the illusion that they will be principals, and, secondly, that a deplorable reception awaits the man who would take up cudgels on behalf of the assistant in such a foreign atmosphere. The question then for all assistants to decide is the kind of organisation they will select, the work they propose to commit to its care, and the manner of its execution.

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* A paper read by Mr. E. J. Dixon, A.R.I.B.A., at a meeting of the Guild of Architects' Assistants on April 18.

The Guild of Architects' Assistants proposes to unite all those who have any title whatever to its designation; it proposes to primarily unite them socially as a matter of course, and, secondly, it has proposed a programme whereby the many grievances under which the assistant struggles, and which before recognising his position as practically that of a mere casual labourer with practically the same wage, it regarded as the necessary struggle of the architectural pilgrim on his way to achieve the crown of glory of a future practice; this programme has now been before the public in the architectural Press for the past eighteen months. It proposes to endeavour to do something in the matter of (1) salaries, (2) office hours, (3) office conditions, (4) recognition of an assistant's work where possible, (5) legal assistance, (6) unemployment bureaux and insurance, (7) education. The Guild will endeavour to carry out the proposals by means of combination, necessitating strength of numbers, and conference with existing societies and principals, necessitating tact and toleration. There are many other advantages a keen, solid combination such as this will immediately suggest, such as parliamentary and municipal action, it being usually found an easier matter to effect changes in the domestic affairs of public bodies by means of correspondence and deputations than in the case of private employers.

The act of bringing forward matters which immediately affect the well-being of the assistant to the notice of existing bodies would have the effect of stimulating the interest of assistants who are members of those bodies.

The inclusion of principals who are interested in this, which the Guild trusts will become the important phase of architectural politics, will provide the necessary element of experience and breadth which such a movement as ours demands. The principal finds it necessary to take some measure of protection for his own interests against the guerilla warfare carried on against him by the unruly members of his class, by taking refuge within the folds of a Registration Bill; but the assistant feels doubtful as to whether he should combine in like manner, and for exactly similar reasons. You see "We don't intend to remain assistants—we shall one day be principals," and then "The idea of combination is so like trade unionism, which, of course, is a thing we must not dream of." There are some of us, however, an increasing number, who, after noticing the gradual removal of the elderly assistant who has failed to arrive, muttering continually, as he shakes his iron-grey head, the dear old excuses and shibboleths, and gradually sinking into that dismal limbo from which no architect's assistant returns, who, I say, desire to bring all assistants together within a bond of union of their own interests, for their own progress and betterment. Whatever is bad in combination let us exhibit enough sense to reject, and whatever is good let us hold fast to whatever borrowed prejudices may be wrecked in the struggle.

To begin with, this Guild of Architects' Assistants welcomes the advice, help, and assistance of all principals who are really interested in the welfare and fate of the assistant. They are able to see the assistant from the business point of view, to appreciate the value of a good assistant, and to condemn the incompetence of a poor one. All principals interested in the better organisation of the profession generally will welcome the advent of any well-considered scheme which redounds to their benefit, which will select, classify, and secure to them the best assistant available on the market, instead of continuing the present method, if it can be so called, of trial and error in the engagement of assistants. Principals will recognise that the assistants are even more interested in any sound scheme for the protection of the profession than they are themselves, that they form a potent numerical factor in all societies, and consequently represent an interest which, if well organised, would unquestionably prove of great value in any movement in the direction of the real reform of the business organisation of the profession or the improvement of the status of its units.

We make no attempt to strictly define the term "Architects' Assistant," regarding as such all who are engaged in the practice of the construction of building and who may be likely to compete with us in business life for any class of work, building, or architecture. We want to make the term "Architects' Assistant" as broad as possible, leaving it to the common sense of those who desire to join us as to their reasons for inclusion.

Apart from all these reasons for the development of the Guild of Architects' Assistants, which we may term "economic," another, and perhaps more powerful one, may be brought forward to justify our existence, and that is the "social" reason. We are the only "Society of Architects' Assistants," the only architectural society having for its primary object the maintenance of the status of assistants. As all other existing societies place the principals' interests first and the assistants' last, so we fill a place in the profession by providing for and maintaining the assistants' interests, and those not without deference to the principal, whom we ask to join and assist us. We have continually reiterated that we have no desire to compete in any way with other societies, but to collaborate and work with and within them. Unfortunately the fact that we must receive subscriptions if we want to live constitutes in some way a challenge to other societies; but we have endeavoured to minimise this possible source of irritation to as low a figure as possible (1) in order to allow our members to remain in existing societies and to work within them, (2) to avoid as much as possible any appearance of competition with other societies. Any similarity that may be apparent in the aims of the Guild in comparison with those of other societies demonstrates firstly, that no radical difference exists; secondly, that the proposals of other societies in relation primarily to the principal are exactly similar to ours in relation to the assistant; and thirdly, the social aspect, that of providing an assistants' society, is exactly similar to that of other societies.

In conclusion, therefore, it is our hope that the Guild of Architects' Assistants, by presenting the assistants' case in an organised fashion to existing bodies, besides carrying out that section of the work which is peculiarly its own, will form a useful cement to existing professional opinion, even if it may not eventually aspire to the position of an important feature in the professional structure itself.

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A Cardiff and District Builders' Association has been formed to protect the interests of those who do not belong to the Cardiff Master Builders' Association.

## FIRE ALARMS.

By T. E. Lander.

*(Concluded from page 247.)*

I WILL now endeavour to explain the principles on which our detector is constructed. We have two forms. The main principles are the same in each, but, in describing these to you, I will use an enlarged illustration of the long form, as all the details of it can be shown in a sectional drawing made on one plane, which would be impossible with the small circular instrument.

This drawing shows our detector as it appears when first out of the glass-blower's hands and before it is mounted. When complete the platinum wires D, E and F are embedded in strong cement, the instrument is supported on springs, and the whole protected from injury by a substantial cover with perforations, which permit free circulation of air.

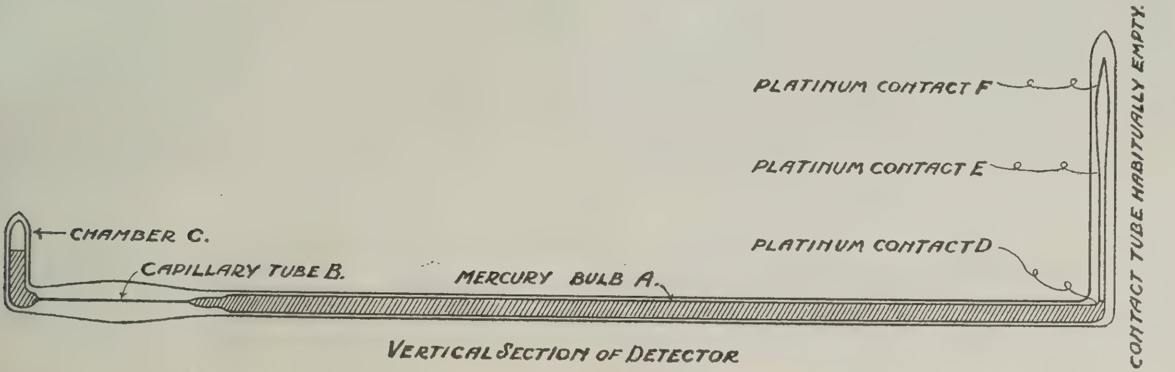


Fig. 1.

A corresponds to the bulb of an ordinary thermometer. This bulb, as I will call it, is always full of mercury, as are also the capillary tube B, and about one-half of the chamber C. The upper portion of chamber C has no mercury in it, and has had the air expelled from it. The upright chamber at the other end of the instrument has also neither mercury nor air in it. The end of the platinum wire D is always in the mercury, and on an outbreak of fire occurring the mercury rises to E., when an electric circuit is completed and a warning gong sounded. Except in the case of an explosion, this warning gong would be sounded so quickly after the outbreak that a single person could almost invariably put the fire out, and the gong will go on ringing until this is done, or until the electric batteries become exhausted; but, if no attention is paid to this warning gong, the mercury, on rising to contact F, completes another electric circuit, and either rings a large gong outside the building to attract the attention of passers-by, or, as would usually be the case in a town, gives a call to the brigade. It will be seen that the space to be filled between E and F is of considerably larger size than that between D and E. This is intentional, as it is desirable that the warning call should be given as quickly as possible, and that between the sounding of this call and the second, or danger call, there should be sufficient time to allow of someone in the building rushing to the spot to extinguish the fire before the brigade is called out. If the fire is a really fierce one from the first, the second, or danger call, would be given in a very few moments. It may be asked what would happen if the fire destroyed the wires of the electric circuit before the warning is given. This is impossible, as far greater heat would be required to destroy the wires than to make the instrument act, and when once either gong has begun to ring the electric current does not pass through the wires in the region of the fire.

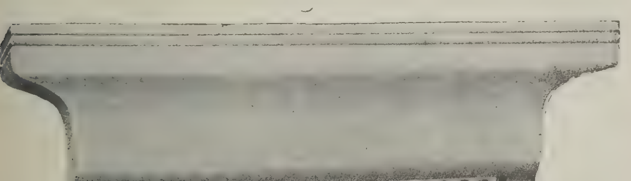


Fig. 2.

The compensation for ordinary fluctuations of temperature, to which I have referred so often, is brought about at the other end of the instrument by means of the capillary tube B and the vacuum chamber C. Under normal conditions the mercury is, when any fluctuations of temperature are taking place, always rising or falling in chamber C, and never moves from the point D. At first one wonders why, when the mercury at C is, as it usually is, higher than at D, it does not enter the contact tube. If we were to replace the mercury with water, capillary attraction would draw it up the narrow contact tube, and it would, as you see in these capillary tubes beside me, stand at a higher level in it than it would in the wide chamber C, but the exact opposite is the case with mercury, for the mercury does not enter the fine upright tube, although it stands at a considerably higher level in the wide portion at the other end. In the detector it passes freely backwards and forwards through the fine capillary tube B, because this is always full of mercury, and it is just as easy for the mercury to go one way as the other; but it has a distinct disinclination to enter a fine capillary tube. It is by regulating the fineness of the capillary tube B that we can bring about whatever degrees of compensation we wish for.

On a fire occurring, the mercury expands more rapidly than usual in the main bulb; it cannot get sufficient relief through the capillary B, and it is forced up the contact tube.

If, as in the case of a smouldering fire, the temperature of the room is not increased at a greater rate than the detector will compensate for, the mercury continues to expand until the chamber C is quite full, and then, again, it must enter the contact tube. By regulating the size of chamber C when the detector is being made, we determine the fixed temperature at which this shall take place.

I would like at this stage to point out a most important feature of this detector, namely, that the platinum contact points and the mercury, being hermetically sealed and in a vacuum, can never corrode, become coated with dust, or in any other way be prevented from making good electrical contact. From what I have said it will be seen that, however cold a room may be, the main bulb is always full of mercury, and that the mercury is always kept pressing against the mouth of the contact tube owing to the "head" of mercury in the chamber C. It is, therefore, always set to exactly the same degree of sensitiveness, and the distance between D and E, of course, cannot change. Although it sounds almost paradoxical, it is quite possible for this detector to give warning of fire while the temperature of the air round it is still below freezing point. The explanation is simple. Assume a room without a fire in it, the temperature of the air 10° Fahr. below freezing point, and the detector one which compensates for fluctuations up to, say, 5° Fahr. per minute. If a small fire breaks out and the temperature rises at the rate of, say, 6° Fahr. per minute, the first warning would be given in about one-fifth of a minute, by which time the temperature of the air would have risen only a little over 1° Fahr., and would be still more than 8° Fahr. below freezing point. I mention this as it is rather an interesting fact, and one which illustrates what really perfect compensation means.

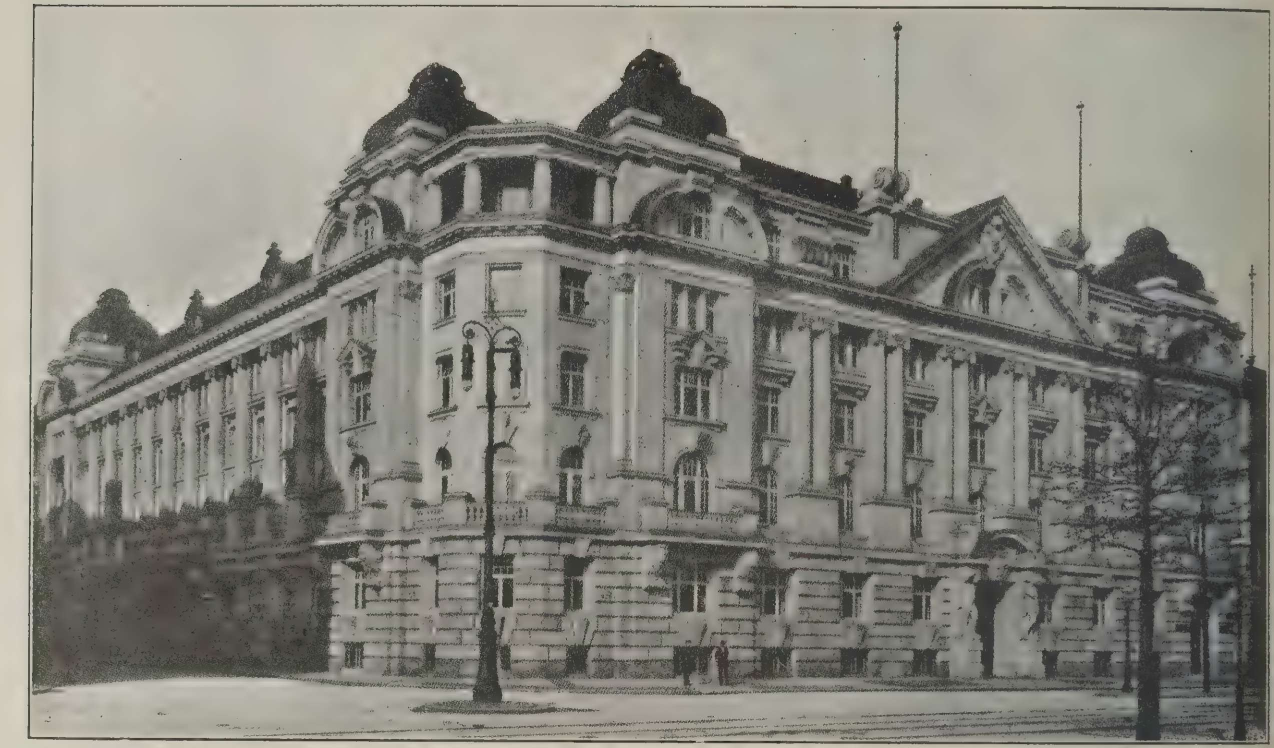
I have thus described the way in which our detector is designed to fulfil the first requirement, namely, great sensitiveness. The way in which it fulfils the remaining qualifications I can explain in fewer words.

With regard to qualification number two, freedom from false alarms, there were, in my opinion, three main causes of false alarms in the past, namely:—

1. Vibration.
2. Imperfect compensation for ordinary fluctuations of temperature.
3. Insufficient knowledge on the part of those installing the various systems of what the normal fluctuations of temperature were.

I think it will be admitted that the construction of our

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Der Profanbau.*

OFFICES OF THE LEIPZIG LIFE ASSURANCE COMPANY, LEIPZIG.—Baurat A. Käppler, Architect.

detectors is such as to ensure that they will be very little affected by vibration. If placed under a floor of ordinary strength, the dropping of such weights as a bale of cotton, a sack of flour, or even considerably heavier things on the floor above, will not affect them at all.

The detectors compensate so perfectly, and it is so easy to make them of any desired degree of sensitiveness, that there is no temptation to us to instal any that are unsuited to the conditions under which they have to work; and the way in which we test these conditions is so accurate that there is no likelihood of our installing unsuitable ones by mistake.

With regard to the third qualification, given sufficient time, the requisite tools, and a knowledge of the principles, a man can prevent any piece of mechanism from performing its proper function, but I really think Mr. Walker has designed a fire alarm system which will puzzle even the deliberate incendiary. The detector, being made of glass, could, of course, be broken easily if unprotected; but it is protected against all ordinary rough usage by the substantial cover which is shown in my second illustration.

This cover cannot be removed without the warning gong being sounded, and if the detector is intentionally broken by forcing something through one of the openings of the cover, the warning is again instantly given. The gongs could be disconnected, but they are, of course, always placed in such a position as could not readily be got at. The wires might be cut, but to provide against this risk our system of wiring is protected in accordance with the Regulations of the Fire Offices' Committee, and, in addition, we use a double return arrangement of wiring which ensures that the system will not be rendered ineffective unless the wires of each group of units are cut at two separate places a considerable distance apart.

With regard to the fourth qualification, to make sure that the wires and batteries are in order, all that is necessary is to press a switch on the indicator board, when a current passes through the whole system and an ammeter shows at once if the entire circuit is not intact. To the right of this switch and ammeter you will notice a row of push buttons with a volt-meter above them. On pressing each of these buttons in turn the volt-meter shows whether the batteries are of full strength. We recommend that these tests be made daily, and, as they only take a few seconds and are all made from one central point, there is no temptation to the man in charge to omit to do this.

The use of automatic fire alarms has, I believe, been greatly hindered through the trouble they caused by false alarms. Naturally the fire brigade and the property owners who have paid for the installations are annoyed whenever a false alarm is given; but almost no new invention is perfect from the first, and time was bound to be required to find out from experience what the difficulties incident to automatic fire alarms were and the ways in which these difficulties could be overcome. Knowing the weak points of the earlier inventions, Mr. Walker set himself to produce one which could be depended on to give warning in the very earliest stages of a fire, while being free from liability to give false alarms, and I can see no room to doubt that he has succeeded.

The principles on which the detector works are simple and easily seen to be reliable; but my belief is also based on the experience of complete installations which have now been in operation for periods up to two years.

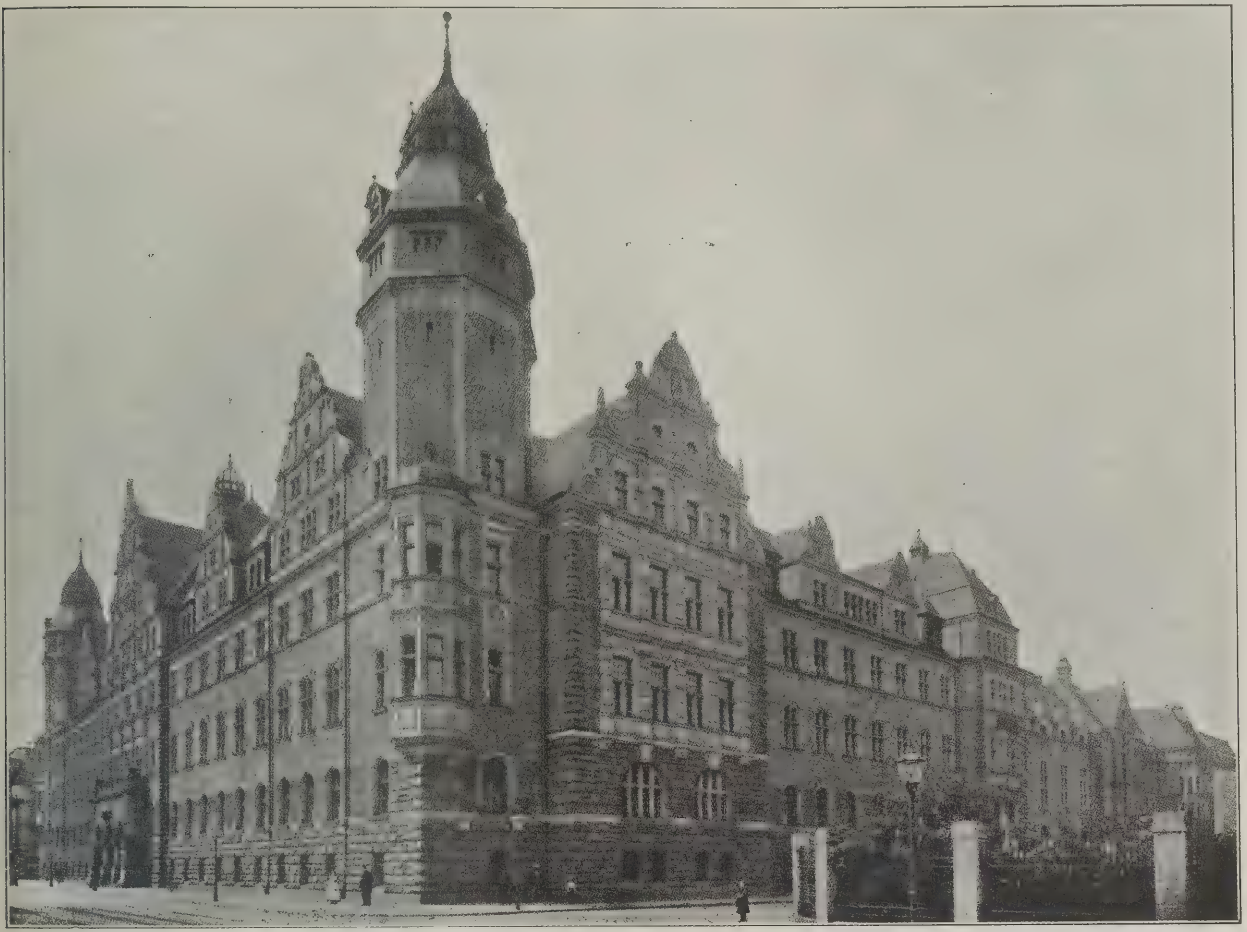
I hope that before long the protection which a reliable automatic fire alarm affords in almost every class of building will be more fully recognised than it is at present. As an instance of the way in which its value is recognised in at least one well-informed quarter, I may mention that some months ago a well-known firm who manufacture fire-extinguishing appliances advised us to approach a certain corporation with a view to getting our system put into one of their public buildings. The firm referred to had been asked to tender for a large number of chemical extinguishers for the protection of this building, but they told us that, unless a really good automatic alarm were installed, they would rather not have their extinguishers in the building in question. They had wisely come to this decision because, after carefully looking into the risk, they saw that there were many rooms in the building which, if not equipped with automatic alarms, might be burning so long unnoticed that hand extinguishers would be of no use. For a hand-extinguishing appliance to be of real use a fire must, of course, be caught in the early stages, and I consider it was very wise of the firm in question to prefer to lose a large order rather than run an undue risk of damaging the reputation of their extinguisher.

I would repeat that a reliable automatic alarm affords great protection in almost every class of building.

While we constantly hear certain classes of buildings described as fire-proof, I think that none of us have ever yet known of one which really was fire-proof. If I am right, then every building in which large numbers of more or less helpless people are housed, such as asylums, hospitals, model lodging-houses, &c., should be equipped with either automatic extinguishing appliances or automatic alarms. The automatic alarm does not pretend to extinguish a fire, but, if it is a reliable one, it will give warning in the very earliest stages of a fire, so early that, with any of the proper

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Der Profanbau.*

NEW LAW COURTS, LEIPZIG.—Herr Theodor Kösser, Architect.

appliances available, a single man or woman should be able to extinguish it. It should give warning in time to permit of the fire being put out considerably sooner than an automatic sprinkler could come into action. I do not wish to minimise the value of the automatic sprinklers: they are undoubtedly of the very greatest value in many situations; but, on the other hand, there are many risks that will in future be protected by automatic alarms which would never be protected by sprinklers. For instance, in warehouses containing goods such as water would destroy to almost as great an extent as fire, or in private houses. I feel convinced that when they are better known automatic fire alarms will be looked upon as essential for every country-house of any considerable size. The destruction by fire of large country houses containing priceless works of art and other valuables is, as we all know, quite a frequent occurrence, and I am convinced that almost all these losses could be prevented by the adoption of a reliable automatic alarm. If discovered within a minute of a flame bursting out, as it should be with an automatic alarm, the fire could be put out with a chemical extinguisher or a few pails of water; but if it occurs in the night, or in an empty room during the day, and it is not noticed until it has obtained a good hold, it is seldom put out until the whole house is destroyed, unless a powerful fire-engine is on the spot and plenty of water available, which is hardly ever the case. Even when I read of stables or byres being burned with the horses or cows in them, I always think how easily, and at what comparatively small cost the loss to the owner and the suffering of the animals might have been prevented.

When anyone wishes to protect his property with automatic fire-alarms, and is in doubt as to which of the various systems is the one best suited to his conditions, our firm is always pleased to fit up a trial installation provided repayment of our out-of-pocket expenses is guaranteed in case an order is not placed with us; and we are always willing to do this whether other firms have been asked to demonstrate the working of their systems or not. The only stipulation we make is that the tests must be carried out under working conditions and that, for at least several days previous to the fire tests being made, no adjusting of the detectors by either our competitors or ourselves shall be allowed. This is the only way in which an intending purchaser can make sure that the rival systems are equally sensitive, and at the same time free from liability to give false alarms.

I will conclude by stating what we consider to be the features in which Mr. Leslie Walker's system is in advance of its competitors:—

1. Owing to the perfect way in which they compensate for normal fluctuations of temperature, we can safely use more sensitive instruments than any other existing firm.
2. We can make the detectors of any desired degree of sensitiveness.
3. The degree of sensitiveness cannot afterwards be altered.
4. We can test correctly the normal rate of fluctuations of temperature in any building.
5. We know the exact rate of compensation, and, therefore, the degree of sensitiveness of every instrument we instal.
6. The contact points cannot corrode, become covered with dust, or in any other way fail to make good electrical contact, as they are hermetically sealed and in a vacuum.
7. Our system provides both a warning and, a little later, a danger call.
8. Our detector cannot be tampered with by inquisitive persons because a warning is given immediately the protecting cover is removed.
9. A warning is given the moment the detector is broken.

## THE CRAFT OF REPAIRING BUILDINGS.*

*(Concluded from last week.)*

We will now turn to a domestic building. I think I may safely say you will not see a finer piece of brickwork anywhere in England than West Stow Hall, near Bury Et. Edmunds. Originally the hall had a moat round it, with a gatehouse and drawbridge. They then filled up the moat and extended the entrance right across it. The building was in a distinctly dilapidated condition. Windows blocked up, walls out of repair and patched with plaster. The front as now finished shows, I think, very well what we consider should be done and what left undone. Whatever was necessary for preservation was renewed, but whatever was pure ornament was left unrenewed. For example, light was wanted, and the blocked-up window was opened out and glazed and other windows were properly glazed. The archers' windows were opened out, but the missing mullions of tracery not renewed; all joints have been raked out and properly pointed.

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* A paper read at Carpenters' Hall on April 6 by Mr. Thackeray Turner, F.S.A., F.R.I.B.A.

My experience is that everyone, when they see a building repaired on these lines, is satisfied, and when a thorough restoration is carried out they are dissatisfied. I was consulted about this building when about a quarter of the work was done. The building was so extraordinarily beautiful that I found it most difficult to give my attention to the prosaic question of what ought to be done. The chief question was whether or not to remove the rough-cast which had been put on over the half-timber work of the upper storey. The danger feared was the decay of oak which had been so long covered up, but it was thought that the great projection of the eaves would be sufficient to protect it and that the interest gained would be worth the risk. The original brick nogging, or filling in between the uprights, remained. There is one thing more about this building, and this is the wall painting over the fireplace in the guard-room over the gateway. It represents the four ages after childhood. A great deal has been written, said, and done on the preservation of wall paintings. In England they are never *frescoes*—i.e., paintings on wet plaster; or *tempera*—i.e., paintings with yolk of egg, but always true distemper paintings, the colours being used just in the same way as we use them now when distempering our walls. The one thing which you must not do is what has so often been done, and that is varnish them. When first done it seems most satisfactory, as it fixes the loose colour and brings the colour out. But it keeps all gases and moisture within the wall and plaster, with the result that eventually the whole painting, varnish and all, comes away and the picture is lost. In most cases the best thing to do is to spray on a little weak size or the fixative used for setting chalk drawings, but if the work is an important one you can read Professor Church's writings on the subject, and you will be safe in following his advice.

I have taken a large number of church towers as examples, because they are structurally the most difficult to repair, for the greater the weight the greater the risk of interference. But let me say here that the reason so many church towers are out of repair is that foolish people in their ignorance drive wedges between bell-cages or frames and tower walls when the cages need tightening, and so the bells batter the walls down, whereas their thrust should be taken by the spring of the wood cage.

In connection with West Ham church tower I will first call attention to the scaffolding, because considerable damage has been done to many a building by its being improperly erected. It was an independent or double scaffolding. Instead of having one single row of poles planted round the building and cutting holes in the walls, as must be done to carry the ends of the cross logs, which the poles do not carry, there was also a row of poles next the wall so that the poles carry both ends of the logs on which the planks are laid, and the wall is left untouched and free all over for the workmen to work on. This tower was found to be a substantial building, but it was faced with Kentish ragstone, which is particularly bad for standing the corroding influence of town atmosphere. The acids had eaten the face of the stone away and had attacked the joints the worst. The walling looked almost as if it was built of decaying boulders. Now the way buildings in such a condition have been treated in modern times has been for the architect to take much trouble to find out a good durable stone and to specify that all the old facing stones shall be cut away and substituted by new facing stones of the approved stone. Westminster Abbey, for instance, has been so faced many times over. The new stone facing, which was done under the direction of the late Mr. Pearson, is at the present time sadly decayed. This method is, we maintain, the wrong one, because cutting out the old stone jars the building badly and so does it harm; because you cannot get a new stone bedded in all round so as to become part of the wall like the old stone was; and because you lose all the interest which was left by the original builders; and after all the new stone will decay like the old unless protected, so why not keep the old stone and repair and protect it? We now know that stonework which is covered with lime cannot be eaten into until the lime is first eaten through; we also know, thanks to Professor Church, that many stones which are decayed can be again hardened by the use of baryta. What was done to these walls was to clear out the joints to a good depth, cut away the decayed stone each side of the joint, and wedge ordinary hand-made roofing tiles into the joint, leaving the edge of the tile nearly flush with the wall face. Then pieces of tile laid flat were built in in mortar above and below the joint, and finally the whole was flushed up with mortar level with the face. Where stones had over their whole surface decayed back behind the wall face, they were faced with tiles built like bricks and the tiles allowed to show.

There are technical points in this method of repair which I think I ought to speak about. First, let me say that the reasons we always use lime instead of cement are that if you cut into old work where cement has been used you will find it as hard as flint, but not homogeneous with the old work. You will also notice where it has been used for pointing that it frequently comes away. I do not say that it is impossible to use Portland cement properly, but the risks of failure are much greater than when using lime; and blue lias lime gives better results than ordinary lime, because it continues to harden for many years. It cannot, however, continue this process unless it can obtain plenty of moisture at first. For this reason hand-made tile is a particularly good material to use, because it holds water like a sponge. The bricklayer, when repairing joints in the manner I have described, should have his mortar on one side of him, which should be composed of washed river sand 5, blue lias lime 1, and a pail of water with broken pieces of tile soaking on the other side of him. Besides his trowel he should have a pair of pincers with which to break the tile to the right size, and a brush with which to throw water into the joint before beginning and in order to moisten the work which has begun to set. No mass of mortar should be more than an inch thick without having a piece of tile in it. All the buildings I have spoken about so far have been repaired by Mr. William Weir, and I consider that he is the greatest authority on this subject of any man living. There is no work which he directs which he cannot do with his own hands.

Mr. Redfern has recently been repairing the garden front of St. John's College, Oxford, one of the finest pieces of architecture I know. The work of repair has been done by filling in the joints and making up decayed stone with tile and mortar, as I have already described, but one new method was introduced. Where stonework, such as mullions, had decayed badly, holes were drilled into the stone and pegs of tile set in the holes so as to give the mortar a hold on to the face of the stone. Where stones have split they can often be jointed by drilling holes opposite one another into each stone, and setting a peg of slate or gunmetal between the two. On no consideration should iron bars, clamps, or dowels be used in stone or brickwork. I am at the present time repairing Cobham Hall in Kent. There are two brick pinnacles which I thought had certainly been shattered by lightning, and which now turn out to have iron rods up the middle of them. For all such purposes copper or gunmetal should be used. If you look at the Horse Guards and other buildings of the same date you will see how the stone facing has broken, and this is due to iron clamps, which were built in, having expanded by corrosion.

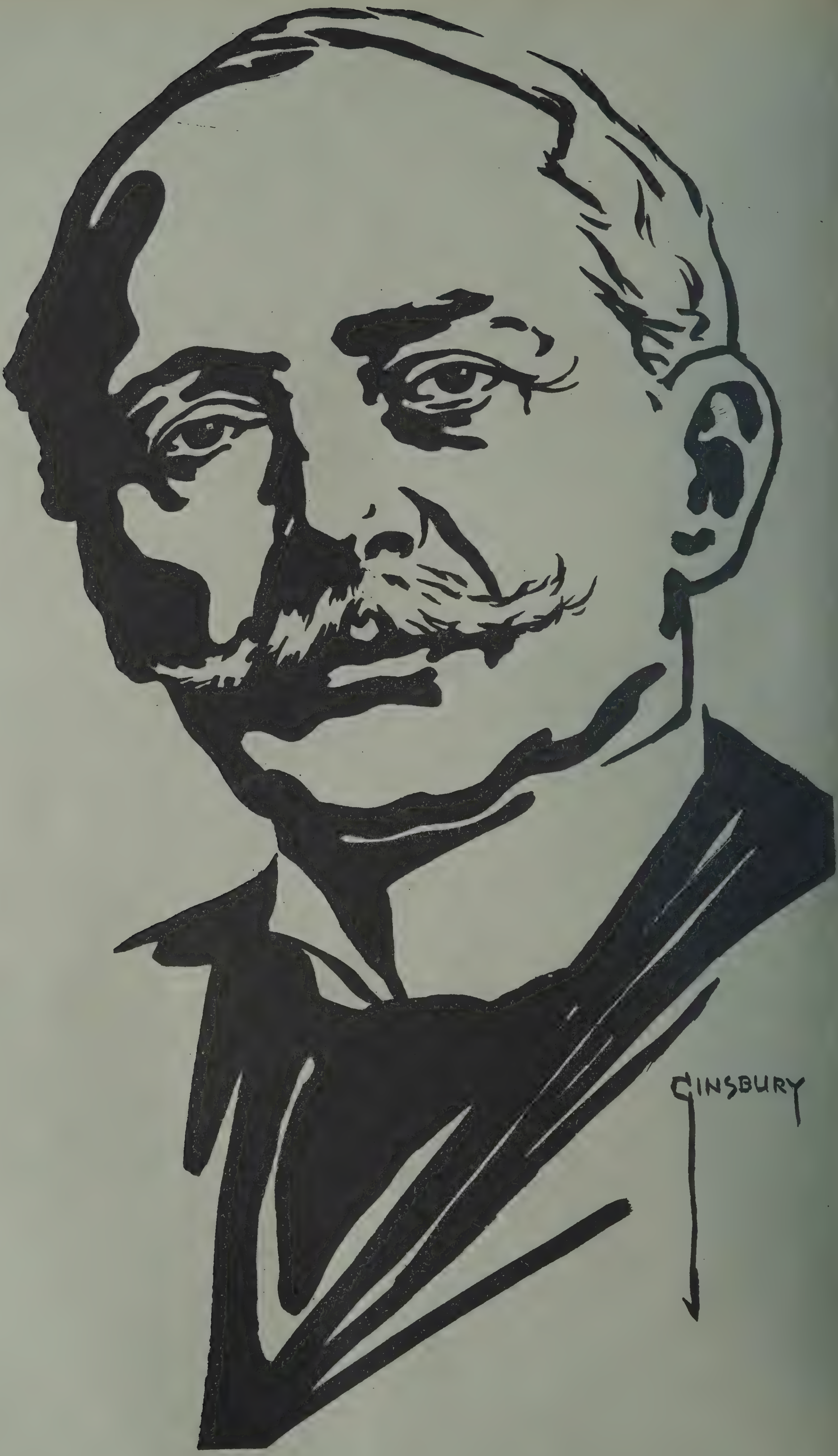
## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) issues a special number, the feature of which is "Detached Dwellings," and fifteen of the most modern examples of American domestic architecture are illustrated. The leading article is on "The Growth of the House in England and the United States," and is an interesting historical criticism and comparison.

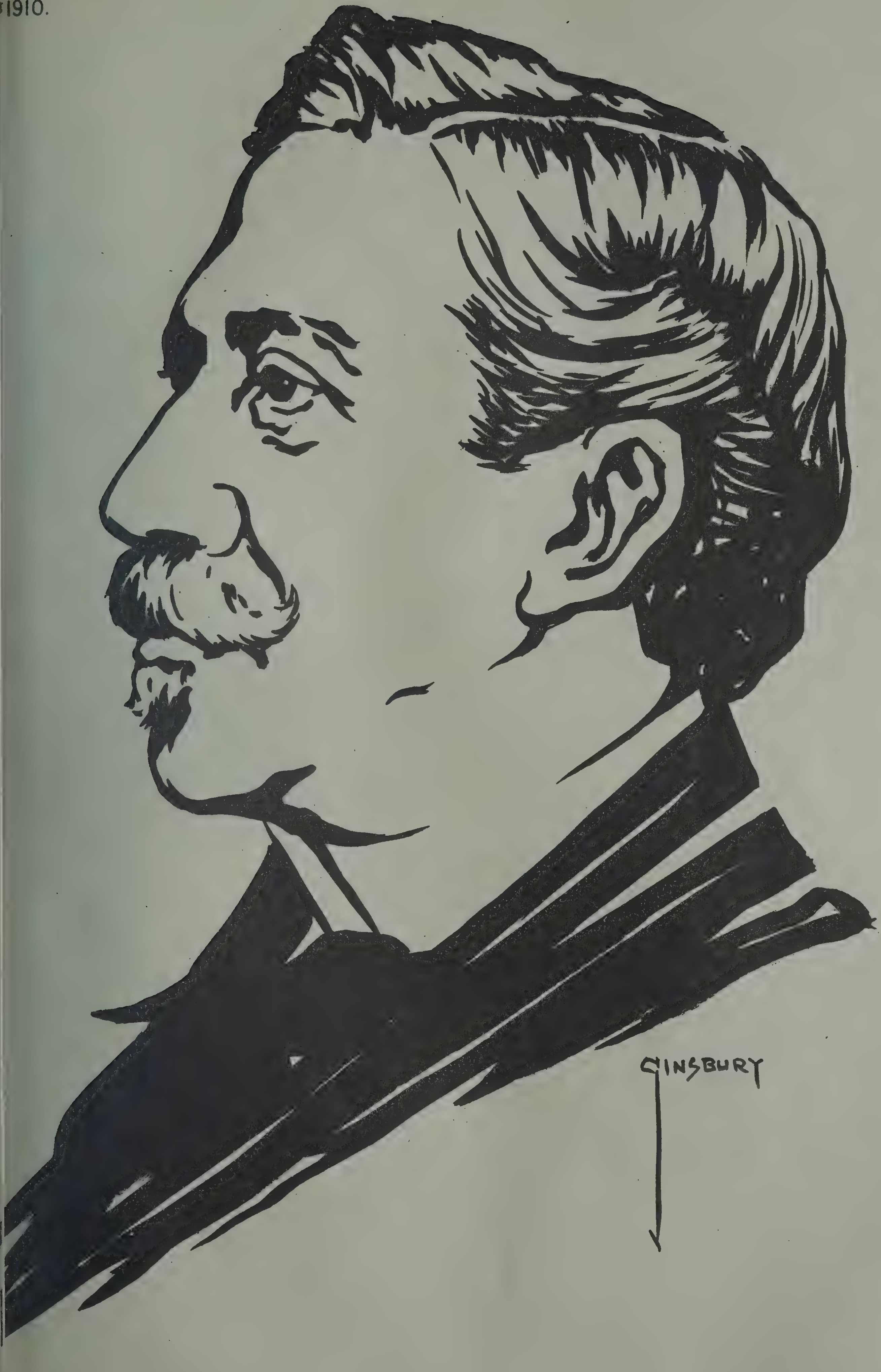
*La Construction Moderne* (Paris) illustrates the first and second designs in the competition for the Achille Leclère prize at the Académie des Beaux-Arts, a floridly treated apartment house at Nice, by MM. Civalleri & Delserre, and the monument to Octave Greard at Paris, by M. Nénot, architect, and M. Chaplain, sculptor.

*Moderne Bauformen* (Stuttgart) devotes its illustrations chiefly to the work of Herr Albert Eitel, of Stuttgart, whose work, though "new art" in principle, is not devoid of historic reminiscence in motif, and is characterised by refined and original treatment of detail. Several designs of Herr Regierungsbaumeister Alfred Fischer, of Düsseldorf, are illustrated, and also a house at Pasing, near Munich, by the Brothers Rank. Coloured plates include work by Mr. Henry Wilson and Mr. Edgar Wood.

*Engineering Record* (New York) contains a paper on "Methods of computing flat reinforced concrete plates," read before the Convention of the National Association of Cement Users, by Angus B. Macmillan.



Living Architects. No. 34: Mr. J. J. Burnet, A.R.S.A., F.R.I.B.A.



Living Architects. No. 35: Mr. William Flockhart, F.R.I.B.A.

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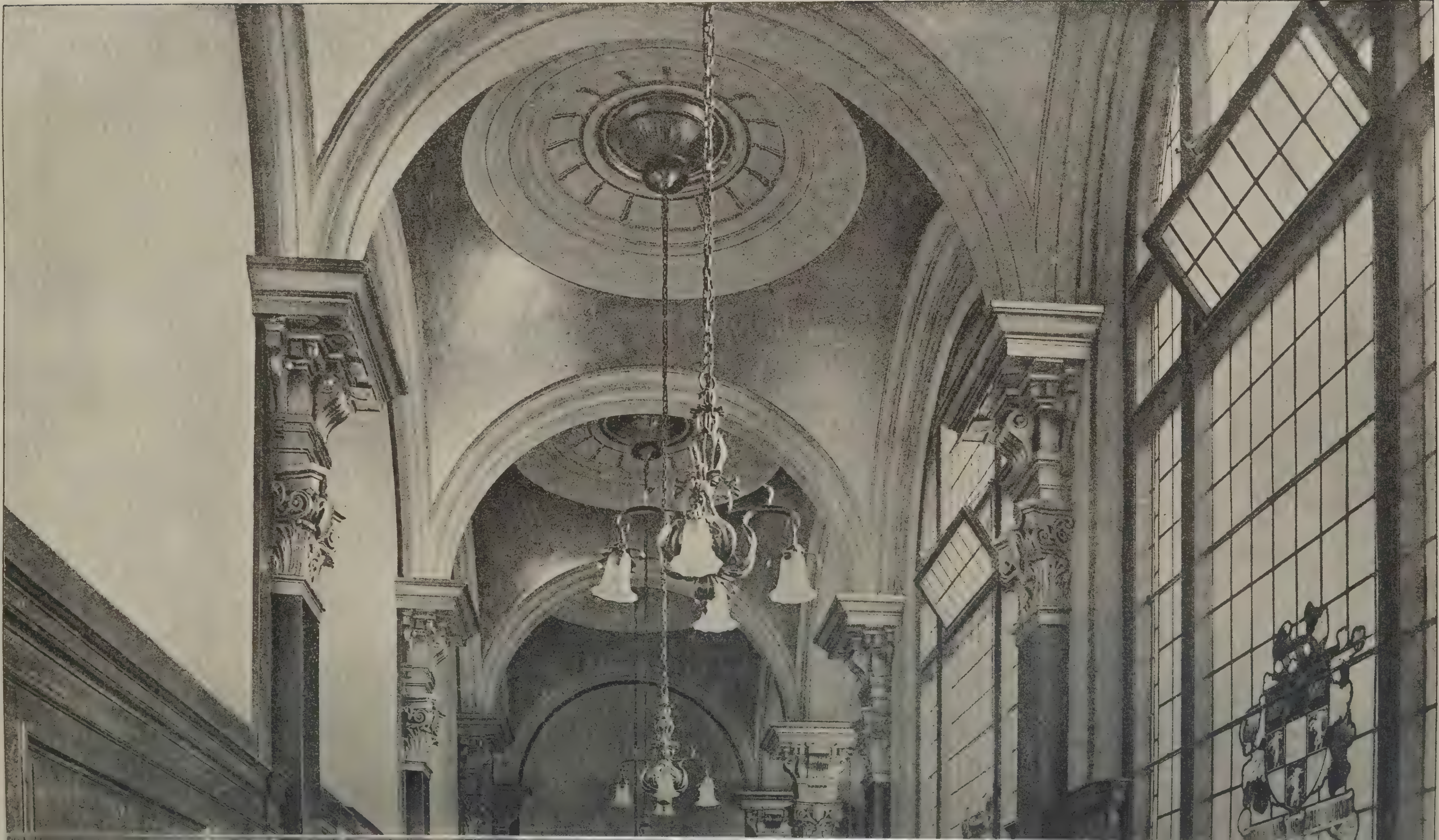

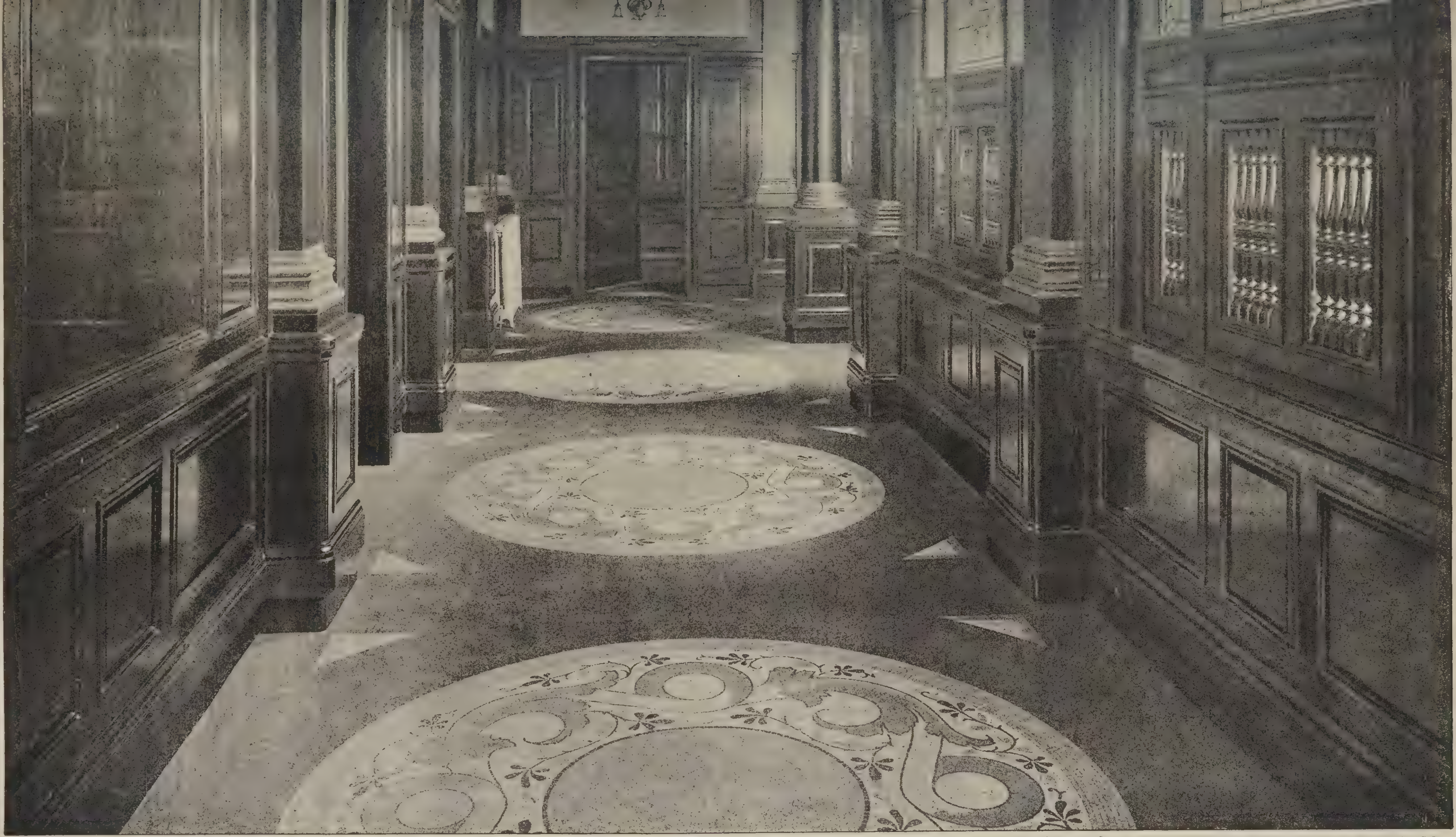

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THE CLYDE NAVIGATION TRUST, GLASGOW: THE CORRIDOR.

Messrs. JOHN BURNET & SON, Architects.

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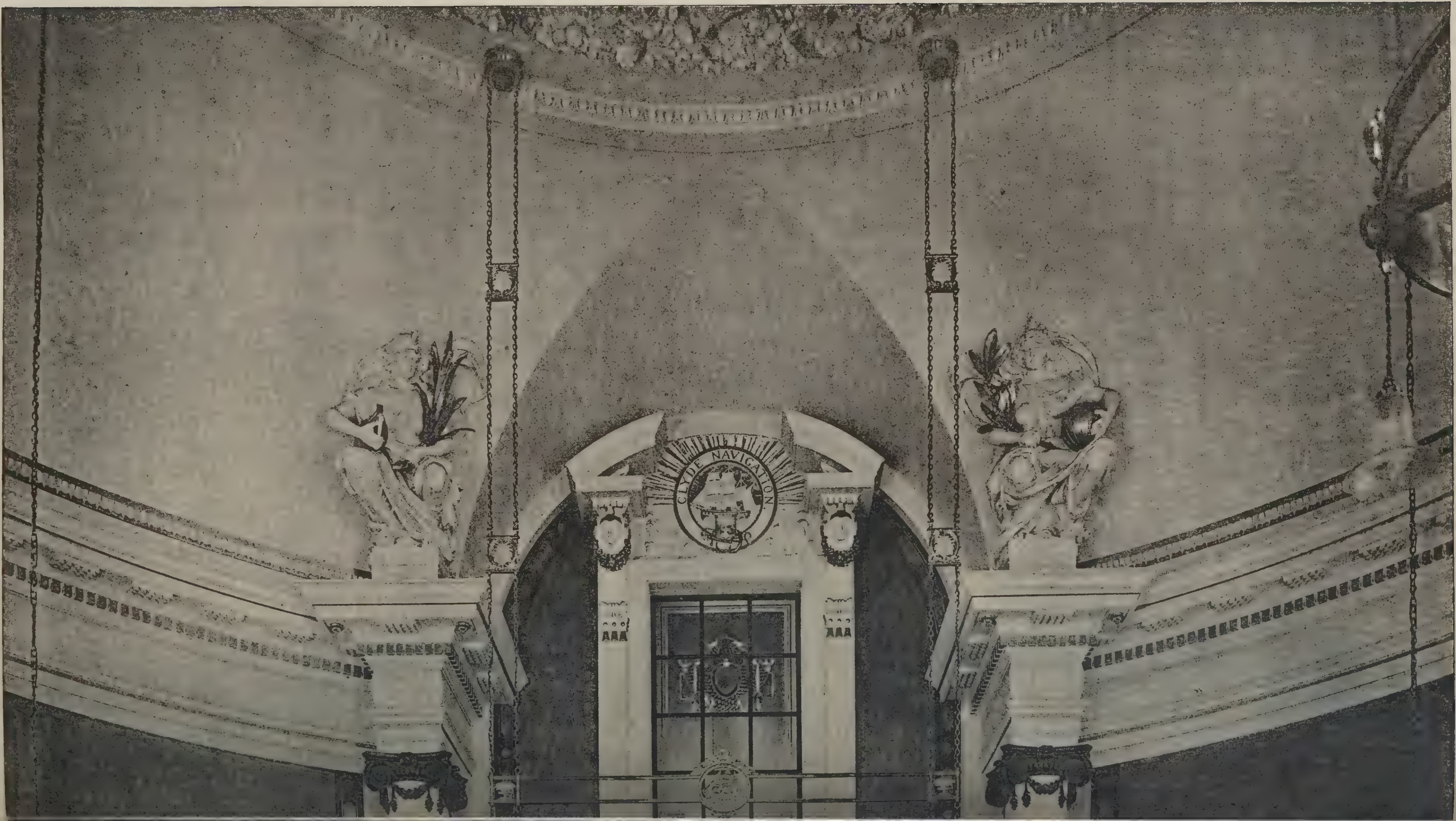
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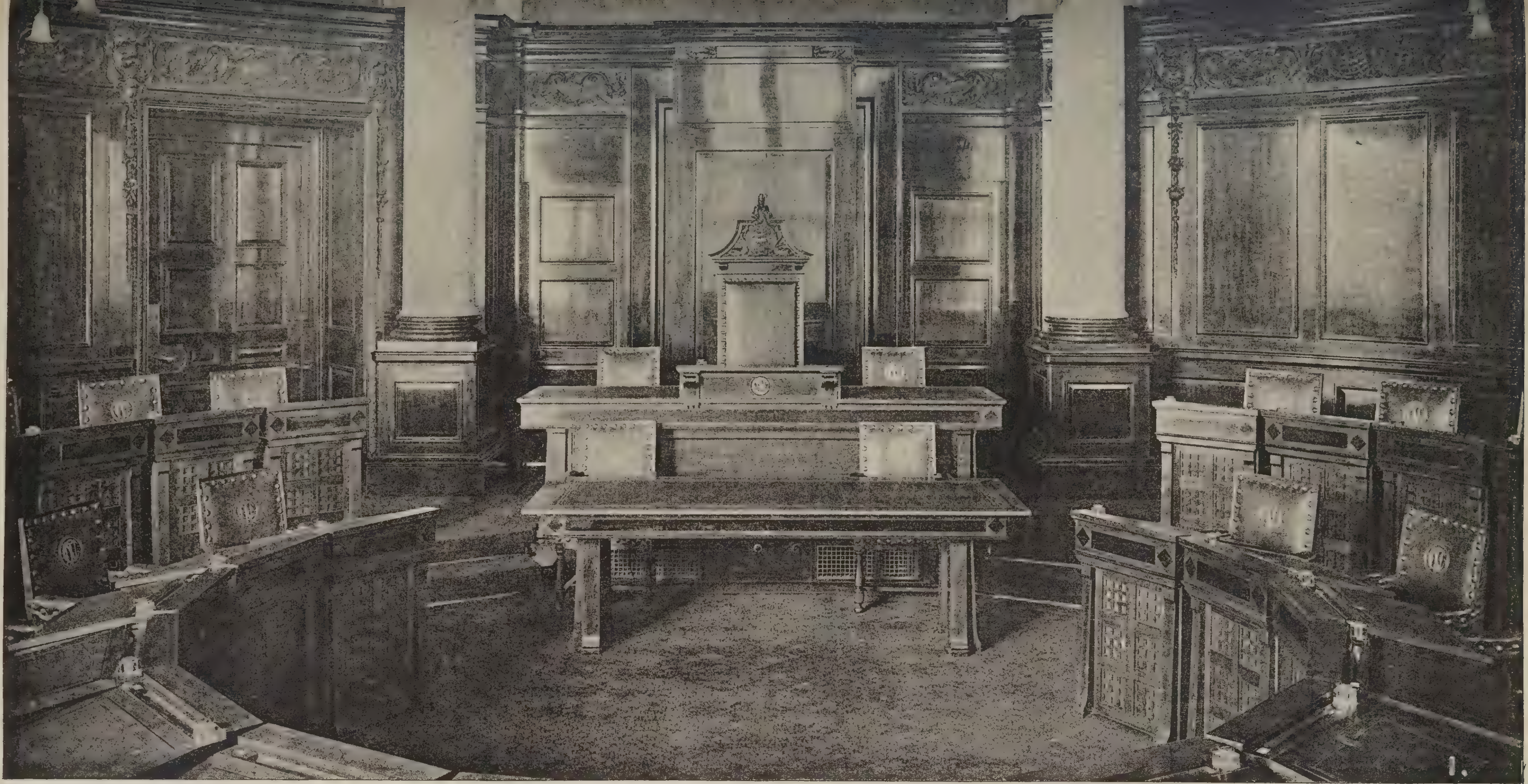

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THE CLYDE NAVIGATION TRUST, GLASGOW: THE TRUST HALL.

Messrs. JOHN BURNET & SON, Architects.

# The Architect.

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## FORTHCOMING EVENTS.

*Saturday, May 7.*

Municipal and Health Exhibition opens at the Agricultural Hall, Islington; closes May 14.

*Monday, May 9.*

British Constitution Association: Paper on "The Land Question," by Mr. C. F. Ryder.

*Tuesday, May 10.*

Royal Archæological Institute: Visit to Westminster Abbey (two days).

*Wednesday, May 11.*

Royal Society of Arts: Paper on "The Recent Discoveries and Restorations at the Guildhall, London," by Mr. Sydney Perks, F.R.I.B.A., F.S.A.

*Thursday, May 12.*

Society of Architects: Paper to be read.

## THE ROYAL ACADEMY EXHIBITION.

Though the present exhibition of the Royal Academy of Arts must be regarded as uneventful and devoid of striking incident, alike in painting, sculpture and architecture, the general impression produced by the Architectural Room is quietly pleasing, as much by the disposition of the drawings hung as by their individual merit. There is plenty of good work exhibited, and some things that are not satisfactory. In sculpture there is much in the smaller works that is excellent and superior to the general level of achievement of those that owe their importance to their size. This is by no means to be regretted, but is rather a subject of congratulation if, as we think it does, it augurs an appreciation of sculpture by the private owner rather than by the museum director.

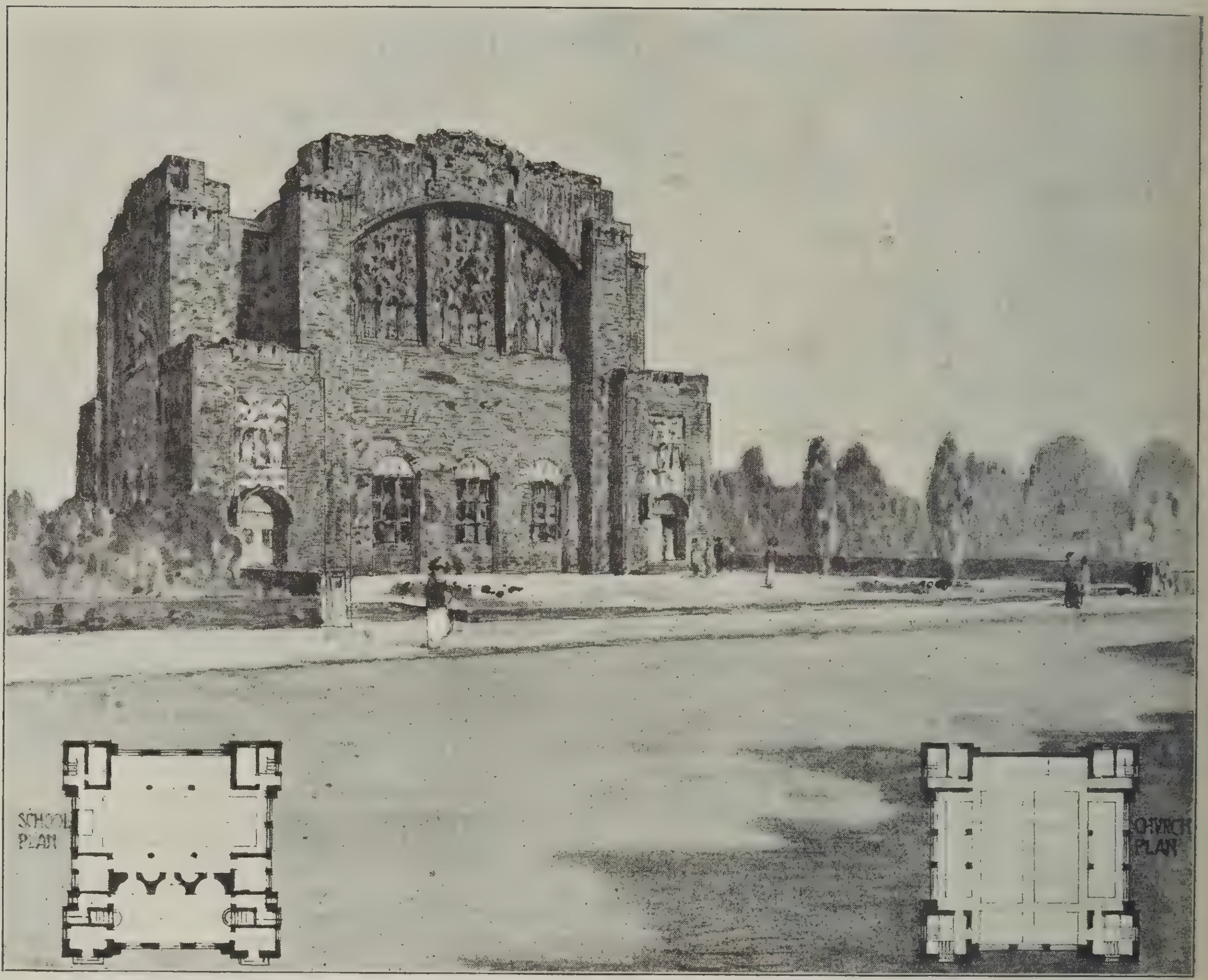
As we enter the Architectural Room we face the diploma work of the most recently elected architect Royal Academician, Mr. John Belcher, in the form of a tinted elevation of the design for the Ashton Memorial, in Williamson Park, Lancaster, now quite well-known, which, by reason of its author's selection as the justification of his election, we may believe to be his idea of pure architectural design untrammelled by considerations of commercial utility or compliance with necessity. Mr. Belcher also exhibits his design for the rebuilding of Holy Trinity Church, Kingsway, London, which, with its lofty tower set back in a circular sweep, maintains a sufficient importance for a building necessarily comparatively low in a roadway of tall buildings. We should like to see the lines of the tower brought down more pronouncedly to the ground to avoid the impression of its support by an obvious screen wall. The perspective is, perhaps, not quite correctly expressive of the architect's intention. This church will be a notable addition to the Renaissance ecclesiastical architecture of London. Mr. Belcher's third drawing is a design for the new building for the Zoological Society of London, Regent's Park, a study in simplicity, in which the breadth of treatment in Mansard roof and plain wall is relieved and accentuated by the use of loggias in the upper floors.

Sir Aston Webb, C.B., R.A., occupies the place of honour on the east wall with a water-colour drawing of "The entrance to the Mall from Charing Cross, showing the opening from Trafalgar Square widened." Despite the widening Sir Aston Webb's building is still shut in and obscured, and so attention is concentrated on the unhappy thinness of the dividing piers of the carriageways. In conjunction with Mr. E. Ingress Bell, Sir Aston Webb exhibits their joint design for "New Building, Magdalene College, Cambridge, from the River," which is eminently expressive of the atmosphere of college life in quiet but not dully decorous fashion. Sir Aston Webb's third contribution is also collegiate, in a sense, being the design for "The Students' Union in Prince Consort Road, in connection with the Imperial College of Science and Technology, South Kensington." The chief excellence of this is in the plan, though the restraint of the external treatment is quite admirable.

On the western wall of the Architectural Room the central position is occupied by a most interesting example of how little beyond brains is needed to transform a brutally ugly piece of engineering construction into a work of art. How many are there of the hundreds of water towers erected in this country that can give a moment's pleasure to the beholder, or even escape execration? Mr. Reginald Blomfield, A.R.A., in his design for "New Water Tower, Lincoln," has shown the difference between engineering and architecture in a four-square lofty tower, 58½ feet square, which, with the cathedral towers, will be a landmark of the city and also an attractive addition to its architecture. Simple in outline, strong in its proportions, with just sufficient introduction of detail to give interest, this design worthily occupies the position in which it is placed. Mr. Blomfield's other exhibits, "Manoir de la Trinité, Jersey," which we illustrate this week, and "New Buildings, Sherborne School," suffer by their proximity to his masterpiece.

Mr. T. G. Jackson's most interesting contribution to the exhibition is his "Suggestion for restoring the Cloister in connection with the necessary buttressing of the south side of the Nave" of Winchester Cathedral. In face of the enormous sums of money recently expended on the reconstruction of the foundations of Winchester Cathedral it is scarcely to be expected that funds will be forthcoming for the building of a cloister walk as an ornamental adjunct to the "necessary buttresses," although the south front of Winchester nave does look shorn and bare in its present condition. Therefore we imagine the "suggestion" will remain such. Mr. Jackson's "New Museum of Archæology and Ethnology for the University of Cambridge" is not one of his successes, being afflicted with all his faults in design and devoid of his excellences.

Mr. Ernest George, A.R.A., and Mr. A. B. Yeates exhibit their design for the "Royal Academy of Music, Marylebone Road," which, it is needless to say, is picturesque, this character being obtained by the composition of a tall central block with low wings and by varied treatment of detail. It will be a refreshing variant to the deadly monotony of the thoroughfare in which it will stand. "Crathorne Hall, Yorks," is one of Mr. George's Classic houses, but with the picturesqueness that one expects as an inevitable accompaniment of his designs on whatever period he elects to base his conception.



ROYAL ACADEMY EXHIBITION, 1910.—DESIGN FOR A CHURCH. By Mr. EDGAR WOOD, A.R.I.B.A.

Mr. RALPH KNOTT's "New London County Hall" is presented in what we may suppose to be its final form, still retaining what we think are its chief defects, the enormous chimney-stacks and inadequate flèche, although this latter has been slightly improved from its original insignificance.

Professor BERESFORD PITE has one of his characteristic dreams, a "Design for approach from St. Paul's Bridge," vaguely suggestive and idealistic.

An interesting study by Mr. W. D. CAROE is his drawing of the "Chapel of St. Mary, Glastonbury: reconstruction from existing evidences," which carries with it the presumption of possibility apart from the justification of the "evidences."

Two models are this year exhibited in the Architectural Room, one for a "Church at Rio de Janeiro," by Mr. EDWARD LARKINS, the other a "National Opera House for a Foreign Government," by Mr. E. O. SACHS "assisted by" Mr. A. H. LISTER. Both are excellent and costly models.

## PAINTING AT THE ROYAL ACADEMY.

IF every successive exhibition at the Royal Academy was the best ever held up to that date, the quality attained in the hundred and forty-second would be extraordinarily good. But this mathematical progression has not occurred, and we are still waiting for the time when the high-water mark of each year's Academy becomes the low-water mark of the next. At present it sometimes happens that an exhibition does not even attain, let alone start off from, the high-water mark of its predecessor. When this unfortunately occurs it is consoling to remember that the set-back is temporary, and that it will act as a foil to succeeding exhibitions. Moreover, it is pertinent to ask how far the walls of Burlington House act as a gauge-glass to the art production of the country, and indicate the position of contemporary painting. It must represent numerically a good proportion of those who seriously practise the art; but this does not necessarily mean that among them are to be found those with the greatest skill or who are really representative of the artistic impulses abroad in the land.

There will be few to maintain that the Exhibition opened on Monday is of outstanding merit so far as the paintings are concerned. Many may say that it is up to a fair average; while there are sure to be some who, speaking more in sorrow than in anger, will describe it as a poor one. Apart from technical reasons it is regrettable that there is not the usual number of pictures which can be described as pictures of the year, by which we mean pictures which for some more or less obvious reason arouse public enthusiasm or public curiosity. Such works act as a sort of condiment to the whole and render palatable much which, though nutritious in itself, is more wholesome than attractive. This year it is difficult to feel intensely interested in any one picture, and the after-impression is about many rather than the few. Obviously it very much depends on what the visitor expects to see whether he will have a disappointment or not, and perhaps for that reason it is wiser to wait until someone glowing with expectation and optimism has paid a visit and passed a verdict. It would be easy for an intending visitor to place his expectations at so low a level that an agreeable surprise would await him. For there is a very large amount of very excellent work, and each gallery has its sprinkling of interesting pictures.

Almost the first picture on the walls is the diploma work of Mr. J. J. SHANNON deposited on his election as an Academician. The title, *Black and Silver*, perhaps suggests the fact that the work is intended primarily as an exercise of skill. The seated half-length figure is clamantly modern, so is the handling, and the whole is undeniably clever. His three other works are portraits, also of women, and all are inspired by the same forceful handling. The portraits this year seem more numerous than ever; indeed, it is sometimes a positive relief to come across a group of pictures which deal with something else. Sir E. J. Poynter has two, Mr. Charles Sims has one; there are three by the late Sir W. Q. Orchardson, six by Sir Luke Fildes, one by Mr. S. J. Solomon, three by Mr. Frank Dicksee, six by Mr. A. S. Cope (including the portrait of Mr. T. E. Collcutt for the Royal Institute), four by Sir H. Von Herkomer, three by Mr. W. W. Ouless, and so on. These are a few of the portrait painters from among the ranks of the Academicians; the list might be extended indefinitely if it was made to include every contributor of a portrait whether under a fanciful title or under the name of the sitter. The majority of the sitters are of no particular interest to the general public, and they do not appear to have inspired the artists. Mr. C. Sims makes a new departure in *Mrs. Hayes Sadler*, and has bravely tried to fit his subject to the typically poetic background; probably his real pleasure lay in the latter, which suggests a "Fête de Nuit." His Majesty the King is perhaps too important for any painter to attempt anything further than a likeness; whatever the reason may be neither of the two large portraits can be regarded as a worthy legacy to future generations.

It is remarkable that not one of Mr. John S. Sargent's four works are portraits. And yet his contribution to this year's exhibition must be accepted as most important and conspicuous. His *Glacier Streams* will be talked of as one of the pictures of the year; others may prefer *Vespers*, which is a delight to the eye in its simple directness and restraint, or *Albanian Olive-gatherers*. Of special interest to our readers must be the two historical pictures by Mr. Edwin A. Abbey for the State Capitol at Harrisburg, Pennsylvania. There is something about *The Camp of the American Army at Valley Forge*, 1778, which at a glance impresses the spectator with its architectural character; this effect being partly due to the straight horizontal and perpendicular lines of the muskets and partly by the admirable grouping. The other picture is less satisfactory; it stands 24 feet high and about 6 feet across. A very considerable portion of the canvas is occupied by an elm tree, at the foot of which stands Penn with a small staff and a large body of Indians—the subject is *Penn's Treaty with the Indians*. In its present position it is not unlike one of the wings in the theatre when the scene is set for a forest. Possibly when placed in position it may prove as satisfactory as the other picture, though it hardly seems so now.

Another large work which suggests that its ultimate destination will be as a panel in a building comes from Professor Gerald Moira. His *London* is a somewhat puzzling composition, for it is neither allegorical, nor historical, nor mythological. The artist has in the past expressed strong opinions on the desirability of present-day artists fearlessly handling contemporary subjects, and here he has practised what he preaches. The standpoint is an imaginary terrace on the south bank of the Thames facing St. Paul's; to the left is a lofty Classic portico, and on the right a variety of people, no doubt types of the citizens, who are not doing anything very definite. In the same gallery is *Flying a Kite*, one of the two much-talked-about works by Mrs. Laura Knight; from its size and almost from its subject it might not be out of place in the town hall of some authority which competed for juvenile holiday makers. The other picture by Mrs. Knight may at first be mistaken for one by Mr. H. S. Tuke, for *Boys* bears great resemblance to the groups of bathers which the Associate has frequently shown; it seems, however, to lack the dignity of the latter's works. The artist who has had real experience in the alliance of architecture with painting is Mr. Frank Brangwyn, A.R.A. His one work *Wine* will loom large in any permanent recollection of the 1910 Royal Academy. It is a fascinating picture although far from a charming one; if it were not so skilfully done it would be repulsive. The whole is so splendidly decorative that it does not seem any great matter that the painter's precise meaning is obscure. How unlike this picture is the charming *Silver Morning* by Mr. Arnesby Brown, which hangs in the same gallery and which is another of the few conspicuous contributions to this year's show! This is one of the Chantrey purchases, and is a wonderful example of the painter's forte.

There are many welcome landscapes and seascapes which make a refreshing contrast to the figure subjects. For example, *The Green Pool* by Mr. Alfred East, or *The Little White Mill*, by Mr. G. D. Leslie, become all the more acceptable from their uninteresting environment. Such familiar contributors as Mr. B. W. Leader, Mr. J. Farquharson, Mr. W. L. Wyllie, Mr. MacWhirter, Mr. David Murray, Mr. Alfred East, Mr. R. Vicat Cole, and Mr. Julius Olsson all help in this way.

## NOTES AND COMMENTS.

His Royal Highness the Prince of Wales has signified his appreciation of the work done by the Royal Institute of British Architects by extending his patronage to the Institute.

Recognition is the strongest asset of any society that purports to represent any section of the community. The Royal Institute is to be congratulated on the recognition it has obtained at the hands of the Heir Apparent to the Throne, who in this, we may venture to say, is bringing to a focus the recognition that the Institute has been steadily endeavouring to achieve, and has in no small measure already achieved, in the mind of the British public as the accredited representative body of architects and the authoritative representative of the art of architecture in this country.

The number of contributors to the work of our Students' Sketching and Measuring Club for April has fallen considerably below the average as regards numbers, but the quality is excellent. We shall give our critique of the drawings and announce the name of the winner of the prize in our next issue. With regard to the subject for June we may say in answer to an inquiry that work now in a museum is not debarred if originally "executed during the fourteenth or fifteenth century, in an ecclesiastical building erected in Great Britain or Ireland."

The struggle at Manchester over the old Infirmary site is far from being ended. It is, as our readers know, coveted by the advocates of an art gallery and free library as a municipal institution, on the one hand, and, on the other, by the Manchester Royal Exchange Subscribers' Association. Art and education *versus* business. The report of the special committee of the City Council was in favour of art and education. The Council, by a small majority, has refused to adopt that report, and referred it back to the committee.

In the *Art Journal* for this month is an illustrated account of the picturesque and typically Swiss town of Gruyères, which being off the main track of the tourist, as marked by the railway, is little known save for its cheese. The architectural student who would get away from the hackneyed work that everyone knows must be motorist, cyclist, or, best of all, pedestrian in the fascinating quest for unspoilt treasures.

The action of G. Gates & Son *v.* Johnson, of which we give a report elsewhere, is useful as upholding the character and efficiency of an architect's certificate, which is not invalidated by an error in the original quantities when these form part of the contract as in this case. Probably if the contract had been made on the plans and specification only, the employer would have had the benefit of the quantities being "short," and the builder would have had to seek his remedy against the person who prepared and supplied the quantities. On the other hand, if the quantities had been too "full," the builder would presumably have had an unmerited advantage, and the employer would have had to make a claim for damages. Hence it is obviously fairest to both employer and builder that the quantities should be made part of, indeed the basis of, the contract. Only, when this comparatively recent innovation in professional practice is adopted, it is obvious that the old-established scale of charges for the preparation of quantities cannot fairly be maintained, as these have always been intended to cover the very imminent risk of a quantity surveyor being liable to compensate either party to the contract who may suffer damage from the frequent accidental inaccuracy of the quantities. We are glad also to note that the contention of the defendant's counsel that an architect's certificate requires a stamp and an appraiser's licence received short shrift at the hands of the judge.

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The memory of William Etty, the famous Royal Academician, is about to be honoured by the erection of a statue in the city of his birth and death. The Corporation of York have proposed to erect a full-size statue of the painter in Exhibition Square, on a space near the King's Manor, formerly occupied by trees which have recently been demolished. The statue will be 7 feet 6 inches in height, and wrought in Portland stone, standing on a pedestal 8 feet high of Bolton Wood stone. The cost of the work will be about 300*l.*, towards which Mr. W. W. Hargrove has already handed to the Corporation the sum of 263*l.*, representing the balance and accumulated interest from the funds of a former exhibition. The Corporation will be invited to find the balance required to meet the total cost. Etty was not only a remarkable painter, but a zealous advocate for the preservation of the antiquities of York, and successfully opposed many attempts on the part of "restorers" and "improvers" to clear away the relics of the past in his native city. The York School of Design, established in 1842, owed its origin almost entirely to Etty's unsparing efforts on its behalf. He delivered the inaugural lecture, and before leaving York he saw the first cast put up in the school—"a proud day for dear old York and me." He lectured to the students at the school on a subsequent occasion, and was a frequent visitor when he had finally settled in the city. The tardy recognition of Etty is thus well merited both for the lustre that his position has reflected on the city of York and for the good work that he did in the preservation of its ancient art and the advancement of its modern advantages.

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The *Antiquary* for this month contains an interesting historical sketch of the ancient Cistercian Abbey of Pontigny by Mr. J. Tavenor Perry, who describes it as "a perfect example of the purest Gothic art in France," and points out its especial interest to Englishmen as the refuge of three of the most famous Archbishops of Canterbury in their time of exile—Thomas a Becket, Stephen Langton and Edmund Rich.

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Bradford Corporation is making a praiseworthy attempt to reduce the nuisance and injury to health caused not only by smoke, but by the emission from chimneys of grit, which frequently follows an attempt to reduce smoke by the use of forced draught when burning cheap coal. Clause 42 of the Bradford Corporation Bill, now before Parliament, is intended to deal with this matter, and has been under the consideration of the Local Legislation Committee of the House of Commons. Sub-section I. provides that every furnace employed in the working of engines by steam, and every furnace employed in any mill, factory, gasworks, waterworks, or other buildings used for the purpose of trade or manufacture, shall in all cases be constructed or altered so as to consume or burn the smoke arising. Sub-section II. provides a penalty on the owner or occupier, or foreman, or other person employed, not exceeding 5*l.*, and on a second conviction 10*l.*, and on each subsequent conviction a fine double the amount of the fine imposed on the last preceding conviction. Sub-section III. extends the provisions to and makes them applicable in respect to the emission from chimneys of grit or gritty particles as if the emission of those particles were smoke arising from furnaces.

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As the result of the Committee's deliberations the chairman stated that they had carefully considered this clause, and they were prepared to grant the Corporation Sub-sections I. and II., subject to the following stipulation. They had been looking at the Act of 1903, and they thought that Sub-section II. should be amended to provide on a second conviction a fine not exceeding 10*l.* and on each subsequent conviction a fine not exceeding 50*l.* Subject to that, the Committee were prepared to grant these two sub-sections. With regard to Sub-section III., that was an entirely new matter, and as it had never been considered before by any Parliamentary Committee, they had had some difficulty in arriving at a conclusion. The Keighley Corporation Act of 1901, which had been brought to their notice, provided that every owner and occupier should use the best practicable means of preventing a nuisance of this character, or be liable to a penalty, and the Committee thought they could grant the Corporation this Sub-section III., provided there were put into it words to make it clear that it must be proved to the satisfaction of the Court that the manufacturer against whom any proceedings had been taken had not used the best practicable means for avoiding the emission of grit or gritty particles.

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One might forgive the inflated prices for old masters if they always resulted in such an encouragement to modern art as in the case of the portrait of *Lady Hamilton*, by Romney, formerly owned by the late Canon Philpotts, who on receiving, somewhat unexpectedly, 3,000*l.* for his picture devoted half the money to the erection of the porch at the end of the south transept of Truro Cathedral, according to the story told in the current number of the *Truro Diocesan Magazine.*

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The first number of *The Town-Planning Review*, the journal of the Department of Civic Design of the School of Architecture in the University of Liverpool, has appeared, and admirably sets forth the view of town planning that is held at Liverpool. Also a fair and unbiassed description is given of town-planning work and schemes in England.

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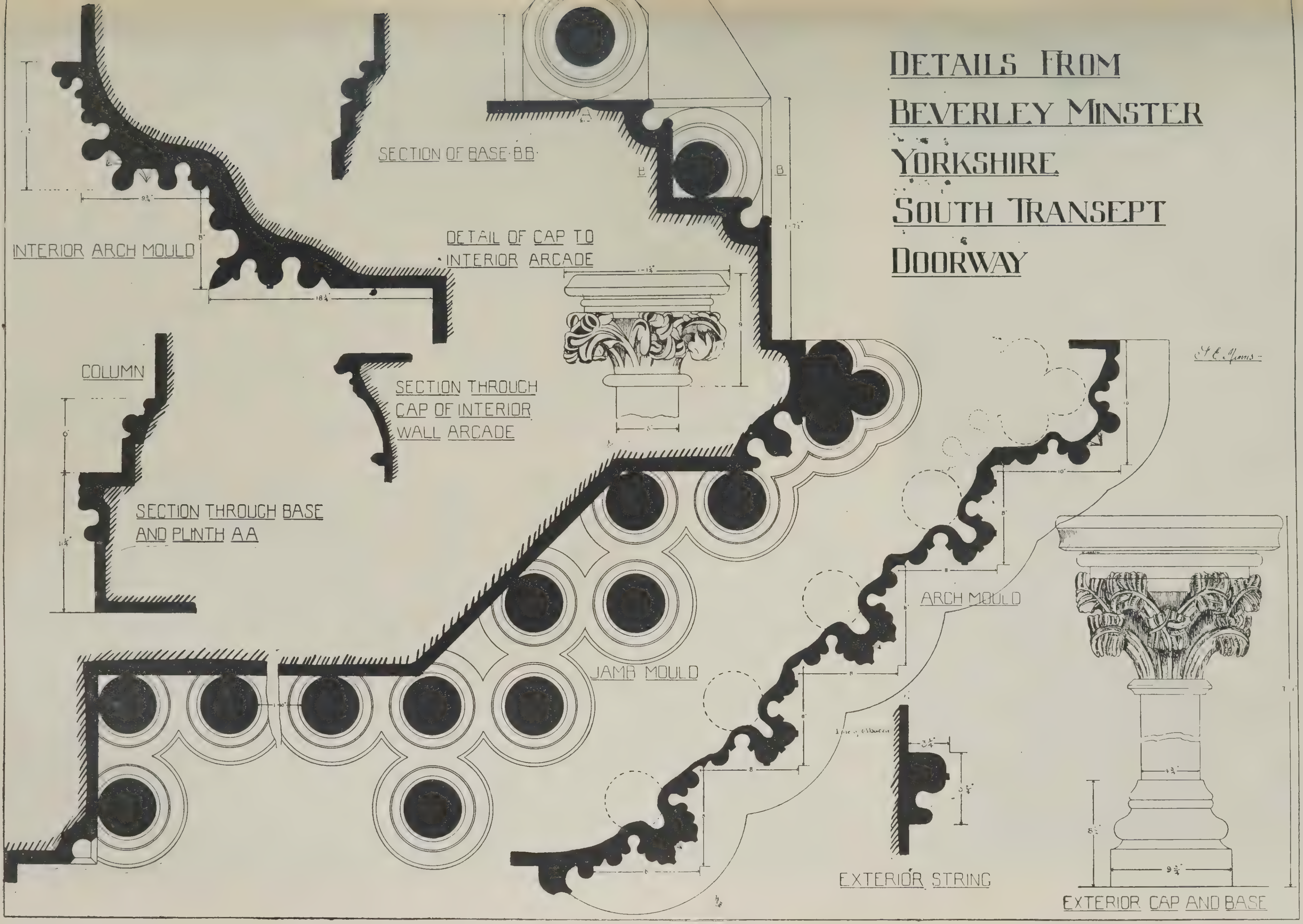
## BEVERLEY MINSTER.

This church may be said to be the result of two great building efforts: the first, which includes the whole eastern arm and transepts was a new design on a grand scale, practically uninfluenced by any previous building; the second was the completion of this same design, after a considerable interval, and was carried out with rare regard for harmony of the whole structure. The building really appears to be larger than some similar structures of greater area, and one of its most pronounced characteristics is its effect of great height obtained by very moderate dimensions.

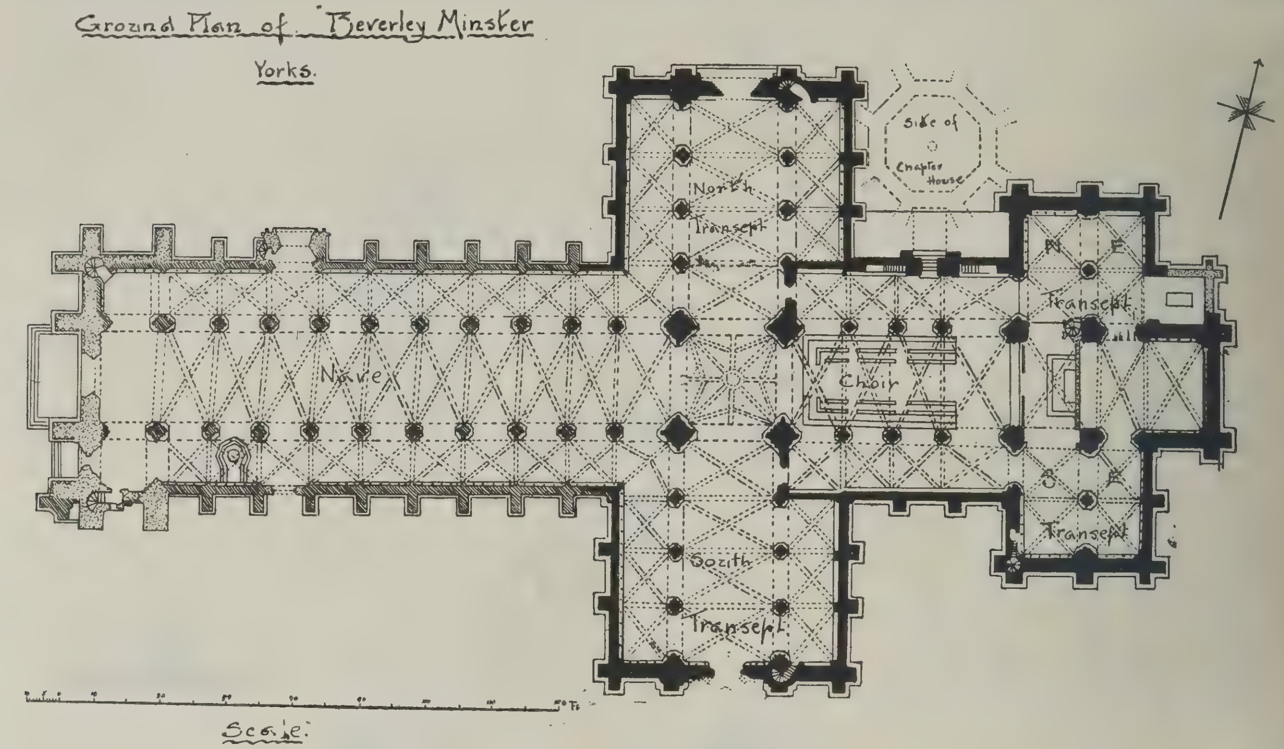
In any general view the absence of a prominent central tower is severely felt, as the actual tower barely rises above the ridges of the roofs, and one longs for a more worthy companion to the two beautiful western towers. Beverley Minster owes its importance to the fact that it contained the tomb and shrine of a famous St. John of Beverley. The Venerable Bede, who received both deacon's and priest's orders from John, tells us how the Bishop founded the Minster, and how in 721 he died and was buried there, his remains being put in a richly-decorated shrine.

The plan of the Minster may be compared with Lincoln and Salisbury, as all three have the double cross, and at Salisbury and Beverley the eastern transepts have an eastern aisle.

The principal dimensions are as follows:—Total interior length, 332 feet 6 inches; extreme breadth,



DETAILS FROM
BEVERLEY MINSTER
YORKSHIRE
SOUTH TRANSEPT
DOORWAY



167 feet 2 inches; width of nave and aisles, 63 feet 1 inch; length of choir between west and east transepts, 67 feet 8½ inches; height of the western towers, 162 feet 6 inches; exterior total length, 365 feet.

The west front is one of the most picturesque and conspicuous features of the whole Minster; it is considered to be one of the finest Perpendicular west fronts in England, and is carried out harmoniously throughout as regards design. The doors in this front are uncommonly rich, and have the hanging feathered ornament. The gable has a real tympanum filled with fine tracery, which is not merely an outside ornamental feature, but contains behind it an extensive room which is at a greater height than the vaulting of the nave.

The exterior of the north side of the nave differs considerably from the south, for the Perpendicular work extends eastwards to and includes the north porch, whilst on the south the Decorated style is seen quite up to the south-west tower.

The nave aisles on both sides are connected with the clerestory by very beautiful flying buttresses.

The great transepts may be compared with those of York and Salisbury, as far as the fronts go, but as far as design goes the fronts of Beverley are by far the most beautiful of the three.

The main features of the design are two triplets of lancets, one above the other, the members of the lower triplets being of equal height; in the upper triplet the centre lancet is taller than the other two. The next stage has a finely-designed wheel-shaped window, and on each side a niche. The upper part of the gable is pierced on the south side by a very narrow shuttle-shaped light. The buttresses are very graceful and terminate in octagonal turret pinnacles. On the ground floor of the south transept is a portal, which is the subject of our illustrations, and consists of a round-headed arch of five members, separated by a clustered column into two doorways, with a blind pointed arch on each side. The windows and other features of the clerestory and aisles of the transepts are pure Early English, dating from before the middle of the thirteenth century. A comparatively long distance separates the great transepts from the eastern transepts, and it is taken up inside by the finely carved choir stalls.

The east transepts have on their end elevations a pair of lancets over which is a beautiful blank arcade. In the next tier is a second pair of lancets with a deep quatrefoil circle above.

In the gables are another pair of lancets, with blank arches on either side, whilst still higher is a single lancet with a blank arch on each side.

On the north side, between the great transept and east transept, in the choir aisle wall, is a door which leads to the modern vestries; these are built on the site of the chapter-house, which was octagonal, and was approached from inside by a double flight of steps in the north choir aisle wall. The east gable was partly reconstructed during the second decade of the fifteenth century, when a vast Perpendicular window of nine lights was inserted, above which is an ogee canopy richly crocketed and terminating in a crown.

The Percy Chapel was built at the N.E. angle by the fourth Earl of Percy at the end of the fifteenth century. In the interior of the Minster the whole of the eastern end, including the transepts is Early English. The north wall of the nave is Early Decorated, and the south wall Late Decorated, but the whole design has been carried out from the first in perfect harmony. The western front and towers are in the Perpendicular style.

The plan of Beverley Minster, with the measured drawings and details of the south transept doorway, form part of the work of Mr. S. E. Minns in "The Architect" Students' Sketching and Measuring Club.

## ACTION ON ARCHITECT'S CERTIFICATE.

In the King's Bench Division, Mr. Justice Walton, sitting without a jury on Tuesday, April 26, heard an action—G. Gates & Son *v.* Johnson—in which the plaintiffs, a firm of builders carrying on business at Rochester, in Kent, sought on an architect's certificate to recover a balance of account for work done amounting to 359*l.* 16*s.* 1*d.*

Mr. Moreton Smith appeared for the plaintiffs and Mr. Schiller for the defendant, who pleaded that the certificate was *ultra vires*, unauthorised, and not binding upon him, and that it did not bear a stamp.

Mr. Smith said that a contract was entered into between the plaintiffs and the defendant to put in the foundations of a factory at Queenborough. Mr. Johnson was a gentleman who carried on business in Germany as a manufacturer of a patent process, and in consequence of a recent Act it became necessary that he should have a factory in this country. With the object of building such factory he bought some three acres of land at Queenborough, and engaged Mr. Boucher, of the firm of Drake & Boucher, as architect. Tenders were invited for putting in the foundations, and in September 1908 the plaintiffs sent in a tender for 1,975*l.*, the tender being made on a bill of quantities. That tender was accepted, but Mr. Johnson wanted a number of alterations made, and therefore a revised tender was sent in, and in the following October a

MANOIR DE LA TRINITE, JERSEY.—Before Alterations and Additions.

contract was signed which included the general conditions of the Royal Institute of British Architects, plans and specifications, and the bill of quantities. The work consisted of excavating and laying in concrete for the building. Amongst the conditions was one to the effect that where alterations were required by the architect the work should be measured and valued. The contract having been signed, the plaintiffs proceeded to peg out the site, but when that was done Mr. Johnson required alterations which were ultimately carried out. The architect, in accordance with the contract, granted his final certificate, which the plaintiffs claimed was binding upon the defendant, who, however, alleged that the architect was wrong in his calculation of what was due under the contract.

Mr. Schiller, in reply to his Lordship, said that his contention was that there was a lump sum contract with certain provisions for variation in the usual form to be paid for by measurement. There had been a mistake in the calculations, and it was sought to make the defendant bear the consequences.

Mr. Smith said that the defendant had altered his mind several times as to the building, and the result was that the architect's measurements were kept of every piece of work which was done. Immediately after the foundations were completed, another contractor came on the scene for the purpose of putting up the building. When the plaintiffs' work was finished the certificate was given, and the plaintiffs forwarded it to the defendant and asked for payment. Then the dispute arose and defendant wanted to re-open the whole question as to measurement. He afterwards, on account of the error in a statement relating to a portion of the work which was carried out, desired to make a deduction up to $10\frac{2}{3}$ per cent. upon the whole amount.

After a discussion as to whether the Court should deal only with the points of law raised as to the validity of the contract or whether the whole merits should be gone into, it was agreed that the latter course should be adopted.

The plaintiff was called and gave evidence as to the transaction confirming the statement of his counsel.

Mr. William Thomas Boucher, the architect, said that finding so many alterations in the original plans he directed measurements to be taken from the beginning. The amount for which he gave his certificate was based upon current prices, and he thought it was fair and reasonable. He did not make any deduction on account of the error in the bill of quantities as to the number of yards of concreting, because he did not think it would have been fair to have done so, the work not having been done.

Mr. Henry Reginald Messenger, quantity surveyor, gave evidence as to the manner in which he had taken the measurements as the work progressed, and the results at which he had arrived.

His Lordship, upon Mr. Schiller proceeding to cross-examine Mr. Messenger as to the charge for certain items, said he was not going to try whether the architect was right or wrong, but only to see what he had done, and try to ascertain whether it was conclusive or not.

Mr. Schiller, for the defence, said that in contracts of this description the usual form was to do work "according to the plans and specifications," but in this particular instance there was the usual provision that the work was to be done "according to the plans, quantities, specifications, &c., prepared by Messrs. Drake & Boucher, architects and surveyors." The whole of the difficulty arose from one error in the bill of quantities. The substantial difference was that there had been a miscalculation of 3,000 yards as the result of an omission by the architect, and the question was who was to suffer the loss.

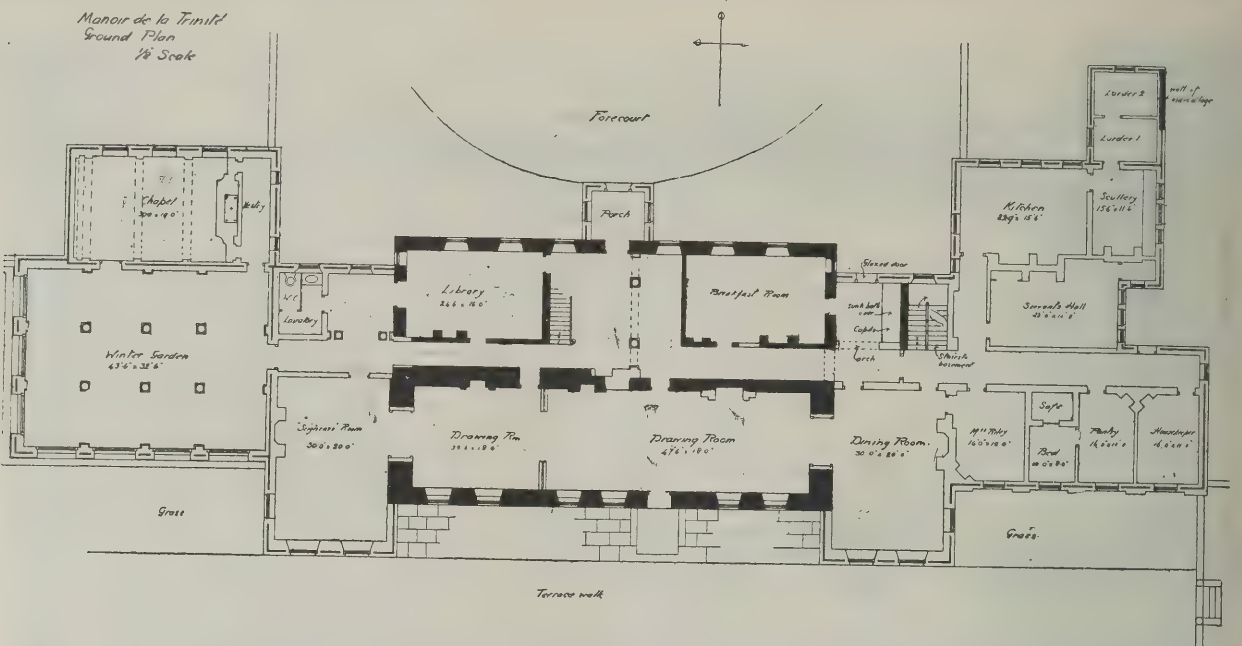
Mr. Justice Walton said he had not yet seen that there had been any loss.

Mr. Schiller said that the contract was that the work was to be done according to specification and quantities, and the plans showed that he was to do 3,441 yards of concreting, while the quantities stated the amount at 441 yards. The tender of the plaintiffs was upon that basis. In the absence of fraud the building owner was not responsible if the builder lost from errors in the quantities according to the plans and specifications prepared by the architect, and it was the duty of the builder when he got his copy of the quantities to compare them with the original document.

Mr. Schiller argued that it was the business of the builder to find out whether the information sent to him was right or not before he tendered for the work.

Mr. Moreton Smith, in reply, said that the tender had been made in good faith upon the assumption that there were only 441 yards of concrete to be provided for, and he had nothing before him to lead him to suppose that the 441 yards was an error.

Mr. Justice Walton, giving judgment on Thursday, said that the first question was whether the certificate of the architect was binding between the parties. The work was done according to specification, and amounts were from time to time paid on the architect's certificates, and in the end the architect issued his final certificate for 815*l.* 4*s.* 2*d.* The question then arose as to whether that certificate was binding upon the defendant. It was said by the defendant that it was not, as the architect did not exercise his jurisdiction properly as to measuring and valuing the omissions and additions. When the work was finished, however, he did measure up the whole of the excavations, and he priced the work according to the bills of quantities. Where the bills of quantities did not apply he priced the work at a fair value. In doing that the architect carried out his duty in a proper way, and his



MANOIR DE LA TRINITE, JERSEY.—Ground Floor Plan, showing Alterations and Additions by Mr. REGINALD BLOMFIELD, A.R.A.

certificate was conclusive evidence that the contractors were entitled to payment of the final balance. It was further said that there had been a misunderstanding owing to the omission of the figure 3 in the copy of the bill of quantities upon which the plaintiff framed his tender, which made it appear that he had to cover an area of 441 yards with concrete instead of 3,441 yards. The defendant argued that although the mistake had been made the plaintiff contracted for the larger area, as he could have discovered the error from the plans and specifications. He (Mr. Justice Walton) did not think that the plaintiff was bound to refer to the other documents in order to discover whether or not the bill of quantities was accurate, and therefore the architect was right in what he had done. Another point raised was under the Stamp Acts, it being alleged that the architect in giving his final certificate was acting as an appraiser, the certificate being an appraisement or valuation and requiring a licence. He did not think so. It was also said that the certificate, being an order to pay, was a bill of exchange and should therefore be stamped; but he was of opinion that there was nothing in either of the points. The result was that judgment must be for the plaintiffs for the amount claimed, with costs.

On the application of Mr. Schiller a stay of execution was granted with a view to an appeal.

# ILLUSTRATIONS.

### MANOIR DE LA TRINITE, JERSEY.

THE Manoir de la Trinité is a granite-built house about three miles from St. Helens in Jersey, the south part of which may date from the early part of the seventeenth century, though the only certain detail of that date is a chimney-piece on the ground floor and possibly the south doorway, with its characteristic Jersey hood mould working out into an ogee. The gables which appear on the photograph are modern. The photograph shows the south side of the house as it is at present. The perspective view is made from the south-west. The property has recently been bought by Mr. ATHELSTAN RILEY, and considerable additions and alterations are to be made to the house, including new dining-room, kitchen, and offices, "Seigneur's" room, winter garden, chapel, &c., with bedrooms over, and a new top storey with new roofs, gables and lantern.

The grounds at present are covered with bushes and trees. A new scheme has been prepared by the architect for a forecourt and approach on the north side and for the entire relaying out of the garden with terraces, pole-hedges, pavilion, and water-garden on south side. These are indicated on the perspective drawing.

The material to be used throughout for all stonework will be Jersey granite with small rough Delabole slates for the roofs.

The part shown in black on plan is existing work, that shown in outline is new.

The architect is Mr. REGINALD BLOMFIELD, A.R.A., of New Court, Temple, E.C.

### REFUGE ASSURANCE COMPANY'S BUILDING, MANCHESTER.—VIEW OF THE COURTYARD.

THE illustration published in this issue of the Refuge Assurance Company's offices in Manchester represents a portion of the courtyard, which is entered by the archway under the central tower. Mr. PAUL WATERHOUSE's work is an addition to the original block, which was designed by the late Mr. ALFRED WATERHOUSE, R.A., some fourteen years ago. The frontage of the new buildings is necessarily in harmony with the earlier block, which is in a very free treatment of Renaissance. In this courtyard, however, Mr. WATERHOUSE has somewhat varied the treatment in favour of a rather severer Classic manner.

### OXFORD COLLEGE SERIES, EXETER.—FELLOWS' LAWN—CARVED SCREEN IN HALL.

WE continue our series of illustrations of Exeter College, which was commenced in our issue of April 22, when a historical account of the College was given. Further views of this College will appear next week.

THE Sheffield Architects' and Surveyors' Society held last week the annual general meeting in the general lecture-room at the University, the President, Mr. W. J. Hale, in the chair. The accounts and annual report of the Council were received and adopted. The ballot for officers resulted as follows:—President, Mr. W. J. Hale; Vice-President, Mr. J. B. Mitchell-Withers; Treasurer, Mr. F. Fowler; Hon. Secretary, Mr. J. R. Wigfull; Council, Messrs. F. E. P. Edwards, C. B. Flockton, J. R. Hall, H. L. Paterson, A. F. Watson, E. Winder, W. G. Buck, C. F. Innocent, and H. I. Potter. The past-presidents are also members of the Council.

THE next Congress of the Royal Institute of Public Health, of which the King is patron and the Prince of Wales vice-patron, will be held at Birkenhead from July 18 to 23 next. Mr. W. H. Lever is the president of the Congress; Sir Alexander R. Binnie, ex-president of the Institute of Civil Engineers, &c., is president of Section IV., "Municipal and County Engineering," and is supported by many distinguished engineers—Mr. Blair, Mr. Brodie, Dr. Cowan, Mr. De Courcey Mead, and others—as vice-presidents. Mr. Henry Vivian, M.P., is president of Section VI., "Town Planning and Municipal Architecture," supported by Professor Adshead and Professor Reilly and others as vice-presidents.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The annual general meeting of the Royal Institute was held on Monday last, when the report of the Council for the official year 1909-10 was submitted and adopted.

Since the publication of the last annual report the Council have held twenty-two meetings, of which the Council elected in June last have held sixteen. The following committees appointed by the Council have met and reported on the matters referred to them:—Competitions, prizes and studentships, finance, sessional papers, premises, professional questions, board of professional defence, board of examiners, fellowship drawings, town planning, school of architecture in Italy, Parliamentary Bill, reinforced concrete, honorary members, Ulster Alliance, Royal Academy Exhibition.

The losses by death have been as follows:—Fellows: Richard Armstrong, Henry Dare Bryan, Alfred B. Burnell, John Archibald Campbell, Thomas William Cutler, Sir Thomas Drew, Henry Bayly Garling, Henry Hall, Jesse Horsfall, George Inskipp, Henry Jarvis, Nathan Solomon Joseph, John Wornham Penfold, Edward Potts, Frederick Hyde Pownall, Thomas Mellard Reade, Frederick Henry Reed, George Campbell Sherrin, Edward Shewbrooks, Henry Stock, Benjamin Tabberer, George Thomas; Retired Fellows: William Owen, Thomas Worthington; Associates: Lionel Gordon Detmar, Walter Edward Mills, Charles Albert Monday, Frederick Henry Williams; Hon. Corr. Members: Auguste Choisy, Baron Henry von Geymüller, Osman Hamdhi Bey, Charles Follen McKim, José Urioste y Velada.

The Royal Gold Medal was awarded last year to Dr. Arthur Evans in recognition of the eminent services he had rendered to the history of architecture by his distinguished work of exploration in Crete. Dr. Evans received the medal in person at the general meeting on November 1, 1909, when he delivered an address illustrated by lantern slides on some aspects of his recent work in Crete. It has been decided to award the medal this year to Mr. T. Graham Jackson, R.A., for his executed works as an architect. His Majesty the King has graciously signified his approval of the award.

The following tabular statement shows the present subscribing membership of the Institute compared with that at the corresponding periods of 1907, 1908 and 1909:—

| Year. | Fellows. | Associates. | Hon. Associates. | Total. |
|---|---|---|---|---|
| 1907 | 862 | 1,254 | 46 | 2,162 |
| 1908 | 906 | 1,288 | 45 | 2,239 |
| 1909 | 888 | 1,344 | 46 | 2,278 |
| 1910 | 874 | 1,431 | 48 | 2,353 |

The number of associates shows a considerable increase, and the Council desire to urge all associates who are eligible to come forward and apply for election as fellows without delay. During the official year since the last annual general meeting seven fellows have been elected, 118 associates, and four honorary associates.

The progressive examinations were held in June and November 1909. The preliminary was held in London, Birmingham, Bristol, Cardiff, Glasgow, Leeds, Liverpool, Manchester and Newcastle-on-Tyne; the intermediate in London, Bristol, Cardiff, Glasgow, Leeds, Manchester and Newcastle-on-Tyne. The Council desire to record their thanks for the valuable services rendered by the hon. secretaries and examination committees of the various allied societies. The final and special examinations were held in London, and special examinations for colonial candidates in Johannesburg, Sydney, and Toronto. The results are shown in the following tabulated form:—

| | Admitted. | Exempted. | Examined. | Passed. | Relegated. |
|---|---|---|---|---|---|
| Preliminary examination | 257 | 85 | 172 | 130 | 42 |
| Intermediate examination | 273 | 21 | 252 | 116 | 136 |
| Final and special examinations | 246 | — | 246 | 119 | 127 |

The Ashpitel prize was awarded to William John Roberts, M.A., who passed the final examination in November 1909.

The statutory examinations qualifying for candidature as district surveyor in London, and for candidature as building surveyor under local authorities, were held in London in October, and certificates of competency to act as district surveyors in London were granted to Messrs. Baxter Greig and John Halton Markham, and a certificate of competency to act as building surveyor under local authorities to Reginald Guy Kirkby.

The deed of award of the various prizes and studentships was presented to the Institute at a general meeting on January 17, 1910. At the presentation of prizes on January 31, 1910, an address to students was delivered by the President, and a criticism of the work submitted was read by Mr. Mervyn Macartney (*F.*). An exhibition of the drawings was held from January 18 to 29, in the gallery of the Alpine Club, and was visited by 1,100 persons. A selection of the prize drawings is now being sent the round of the allied societies.

"At Homes" were given by the President on June 21, 1909, when a selection of water-colour drawings and etchings were exhibited; and on January 10 last, when an exhibition was held of drawings of deceased architects and draughtsmen. A reception in honour of the visit to England of members of the German Garden City Association was held by the President and Council on July 13, 1909, and through the exertions of the Institute town planning committee, who had charge of the arrangements, an interesting collection of drawings illustrating various ideas of town-planning was exhibited on the occasion. An address of welcome was delivered by the President, and acknowledged by Herr Rehorst, architect of the Cologne Town Council.

Some of the most important work of the year has been done by the town planning committee. In the Housing and Town Planning Act of 1909 an amendment was obtained which will enable the Royal Institute to make representations to the Local Government Board before the approval of town-planning schemes. Under the guidance of the committee a number of town planning committees have been formed by the allied societies, and these are working in co-operation in the study of the problems of town planning, and in bringing architectural influence to bear upon the municipal authorities, who will be charged with the important task of preparing town-planning schemes. Acting on the advice of the committee the Council have decided to organise a Town Planning Conference which will be held in the rooms of the Royal Institute between July 11 and 16. His Majesty the King has graciously granted his patronage to the conference, and the executive committees are arranging a programme of papers by authorities on the subject, and an exhibition of town plans, photographs, and other interesting material. During the course of the year a series of papers on town planning has appeared in the Journal.

Since the issue of the last annual report the following sessional papers have been read before the Institute:—May 17, 1909, "Smoke Abatement," by Sir Wm. Richmond, K.C.B., R.A. (*H.A.*); November 15, "The Planning and Laying-out of Public Places, by H. Inigo Triggs (*A.*); December 13, "Architectural Education in America," by Professor A. D. F. Hamlin; January 17, 1910, "Carr of York," by S. D. Kitson, M.A. Cantab. (*F.*); February 14, "George Frederick Bodley," by Edward Warren, F.S.A. (*F.*); March 14, "The Business Side of Architecture," by A. A. Hudson, Barrister-at-Law (*H.A.*); April 4, "Architecture of the Balkan States," by George Hubbard, F.S.A. (*F.*); April 18, "The Architecture of Adventure," by Professor W. R. Lethaby (*F.*). The final paper of the session will be read on May 23 by Mr. E. A. Rickards (*F.*), subject, "Art of the Monument."

The most important event of the year has been the approval of the new by-laws by the Privy Council. These by-laws were the result of long consideration, first by the by-laws revision committee, and then by the Council, and they were discussed and amended at numerous meetings of the general body during the year. They were finally approved by the Privy Council on March 23, 1910, and it then became possible to receive applications for the new class of licentiates. Steps have been taken to lay the advantages of this class before all practising architects and assistants throughout the Empire, and the response already made is very gratifying.

The new charter has also made provision for the appointment of a Board of Architectural Education with extended powers, and this will begin its important work immediately.

In accordance with a resolution passed at the general meeting of March 4, 1907, the Parliamentary Bill committee have been at work upon the draft Bill defined in that resolution, and when it has been approved by the Council it will be laid before the general body for their consideration.

During the course of the year the Council obtained the approval of the general body to a proposal to purchase the lease held by Messrs. Knight, Frank & Rutley, at 9 and 11 Conduit Street. In the terms of this purchase the Conduit Street Galleries, with their entrance in Maddox Street, and several offices and other accommodation, will be taken over by the Royal Institute on June 24. This will improve the library accommodation and enable the Institute to hold its exhibitions, examinations, and receptions under its own roof in future. Improvements in the arrangement and decoration of the new premises will be made.

Thanks to the services rendered to the Institute by its representatives, Mr. John Belcher, R.A., and Mr. John W. Simpson, great progress has been made towards obtaining the protection of copyright for works of architecture. It is hoped that in the near future this right will be secured by means of legislation.

During the course of the year the Council have been compelled to take action in several cases of professional advertisement and breach of professional etiquette.

Many architects have applied for and received advice from the Board of Defence on questions of principle and practice, and in view of several cases of liability for dry rot the Council have issued two circulars on the subject.

The Council appointed the President, Sir Aston Webb, Sir L. Alma-Tadema, Sir George Frampton, Mr. T. E. Collcutt, Mr. H. T. Hare, Mr. John W. Simpson, and Mr. H. V. Lanchester as a deputation to the Bridge House Estates committee of the Corporation to urge upon them the architectural aspects of the important undertaking of St. Paul's Bridge.

The Building Act Amendment clauses of the London County Council (General Powers) Bill, 1909, were the subject of consideration by the Council, who appointed Mr. Edwin T. Hall (vice-president), Mr. J. S. Gibson (vice-president), Mr. John Slater (*F.*), and Mr. Wm. Dunn (*F.*) to attend conferences upon the Bill called by the London County Council, at which representatives of many other institutions and societies affected by the Bill were also present. At these conferences the action of the R.I.B.A. was supported by almost all the other societies. Failing agreement on the matters in dispute, the Bill was opposed by the Royal Institute, in conjunction with the Institution of Civil Engineers, the Surveyors' Institution, and other bodies, before a Committee of the House of Commons, and later on important amendments in the interests of building owners were obtained as a result of the opposition.

The Council report the continued financial prosperity of the Institute. Although the balance of income over expenditure is only 595*l.* 10*s.* 9*d.*, as against 1,841*l.* 14*s.* 4*d.* last year, this is mainly accounted for by exceptional expenditure incurred in connection with the new by-laws and the opposition to the London County Council (General Powers) Bill. The sum of 1,066*l.* has been invested during the year, and in addition to this a sum of 1,000*l.* has already been paid to Messrs. Knight, Frank & Rutley on account of the purchase of their leases. The invested capital is now over 27,000*l.*

Since the issue of the last annual report the Council have appointed the following gentlemen to serve as the Institute representatives in connection with the various bodies indicated:—

| | |
|---|---|
| The British School at Rome | Mr. John W. Simpson. |
| The Conference on Taxation of Land Values | Mr. George Hubbard.<br>Mr. Edwin L. Lutyens.<br>Mr. Ernest Newton. |
| The Departmental Committee on the cost of school buildings | Mr. J. Osborne Smith.<br>Mr. H. W. Burrows.<br>Mr. W. G. Wilson. |
| The Engineering Standards Committee | Mr. Edwin T. Hall. |
| The Garden Cities and Town Planning Association Conference | Mr. Walter Cave.<br>Mr. H. V. Lanchester.<br>Mr. Paul Waterhouse. |
| The General Council for the National Registration of Plumbers | Mr. H. D. Searles-Wood. |
| The International Congress of School Hygiene, Paris, 1910 | Mr. Edwin T. Hall.<br>Mr. J. Osborne Smith. |
| The London Council for the National Registration of Plumbers | Mr. H. D. Searles-Wood. |
| The National Housing and Town Planning Council Conference | Mr. H. V. Lanchester<br>Mr. John W. Simpson.<br>Mr. Raymond Unwin.<br>Prof. Beresford Pite.<br>Sir Aston Webb. |
| The Royal Institute of Public Health Congress, Liverpool, 1910 | Mr. T. E. Eccles. |
| The Royal Sanitary Institute Congress, Brighton, 1910 | Mr. Edwin T. Hall.<br>Mr. Max Clarke. |
| The Sanitary Inspectors' Examination Board | Mr. H. D. Searles-Wood. |
| The University of Sheffield Court of Governors | Mr. J. Alfred Gotch. |
| The University of Bristol Court of Governors | Mr. Mowbray A. Green. |

Since the issue of the last annual report the Council have made the following grants:—Architects' Benevolent Society, 100*l.*; Architectural Association Sketch Book, 25*l.*; Architectural Association, 100*l.*; Artistic Copyright Society, 26*l.* 5*s.*; British School at Rome, 21*l.*; Concrete Aggregates Commission, 25*l.*; Royal Architectural Museum, 21*l.*; Sheffield Society, 12*l.* 10*s.*

The competitions committee have had under their consideration all the conditions issued by various promoters, and in cases where the conditions have been unsatisfactory, letters urging modifications have been sent to the promoters. In the case of the competitions for the Warrington elementary school, the Workington technical school, and the Acton school, the committee's efforts to obtain satisfactory amendment of the conditions having been unavailing, the Council, by publication in the *Journal* and in the professional Press have advised members of the Institute not to take part in them. The following have been the President's appointments to assessorships during the official year:—

| | | |
|---|---|---|
| Aberdare | Fever Hospital | Sir William Emerson. |
| Birkdale | Design for building in glazed brickwork | Mr. Max Clarke. |
| Bloxwich | School | Mr. Edmund Wimperis. |
| Blyth | Secondary School | Mr. J. Alfred Gotch. |
| Cardiff | National Museum of Wales | Mr. Edwin T. Hall, to act in conjunction with Sir Aston Webb and Mr. J. J. Burnet. |
| Chislehurst | Cemetery | Mr. Ernest Newton. |
| Herne Bay | Pier Pavilion | Mr. Edwin T. Hall. |
| Johannesburg | Municipal Buildings | Mr. Leonard Stokes. |
| Kentish Town | Mission Hall | Mr. Andrew N. Prentice. |
| Liverpool | Arts Building | Mr. E. Guy Dawber. |
| London | Medical Examination Hall | Mr. Thomas E. Colleutt. |
| London | Peabody Buildings | Mr. Paul Waterhouse. |
| Peterborough | Girls' Secondary School | Professor F. M. Simpson. |
| St. Annes-on-Sea | Golf Club House | Mr. Ernest Newton. |
| Stockport | Library | Mr. Percy S. Worthington. |
| Watford | Grammar School | Mr. Ernest Newton. |
| Wigan | Elementary School | Mr. John W. Simpson. |
| Wimbledon | Hospital | Mr. William A. Pite. |

Copies of the "Regulations" have been sent to the promoters of the following competitions, together with letters requesting that a copy of the conditions be sent for the Institute Library:—

Aberdare: Fever Hospital.
Aberdeen: Elementary School.
Acton: School.
Ballater: Hospital,
Ballsbridge: Park lay-out.
Bloxwich: Public Elementary School.
Blyth: Secondary School.
Bothwell: Schools.
Brae Head: Academy.
Burslem: Public Buildings.
Cardiff: National Museum.
Coventry: Municipal Buildings.
Cradley Heath: Sunday School.
East Molesey: Isolation Hospital.
Edenderry: Municipal Offices.
Eltham: Parish Hall.
Endcliffe Park: Church.
Harpenden: Public Hall.
Herne Bay: Pier Pavilion.
Huddersfield: Church.
Karachi, India: Municipal Offices.
Kendal: Technical School.
King's Norton: Elementary School.
Larne: Technical School.
Leeds: Business Premises.
Minehead: Shelter.
Newburn: Council Offices.
New Cross, S.E.: Branch Library.
Oldham: Town Hall Extension.
Otley: Grammar School.
Preston: Grammar School.
Renfrew: New Offices.
St. Albans: Library.
Scarborough: Café and Promenade.
Soke: Secondary School for Girls.
Stoke: Council School enlargement.
Stoke-on-Trent: Town Hall.
Tralee: Carnegie Library and Technical School.
Wakefield: Elementary School.
Walsoken: School.
Warrington: Elementary School.
Whitby: Secondary Schools.
Whitley Bay: Elementary School.
Wood Green: Public Baths.
Workington: Technical anl Secondary School.

## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at the premises in Tufton Street, Westminster, Mr. Henry Tanner, F.R.I.B.A. (President), in the chair.

Messrs. A. Lowry and F. C. L. Toye were elected members.

The President received the scrutineers' report on the voting papers for the election of officers for the next session. The scrutineers in their report stated that 373 voting papers were received, but four had to be rejected as invalid. The results were as follows:—

### List of Officers, Session 1910-11.

President: Mr. Arthur Keen; Vice-presidents: Mr. G. C. Horsley and Sir A. Brumwell Thomas; Council: Messrs. C. Wontner Smith, F. D. Clapham, W. Curtis Green, Horace Field, F. Winton Newman, Herbert A. Hall, Cecil C. Brewer, W. J. Tapper, P. W. Lovell, and Percy May; Hon. Treasurer: Mr. Henry Tanner; Hon. Editor A.A. Journal: Mr. A. Foxley; Hon. Librarian: Mr. G. G. Wornum; Hon. Secretaries: Messrs. Edwin Gunn and G. Leonard Elkington.

A cordial vote of thanks was passed to the scrutineers (Messrs. F. T. Bush, H. B. Elkington, G. D. G. Hake, R. Lowry, B. F. Matthews, and A. J. Perrin) for their services in connection with the elections.

The President announced the first summer visit fixed for Saturday, May 28, to the piano factory of the Orchestrelle Company at Hayes, by kind permission of the architect, Mr. Walter Cave.

The President said the water-colour class was not properly supported, and unless more members joined the extremely useful and interesting class would cease. If a sufficient number of students gave it their support, the Council proposed to make arrangements for holding six outdoor meetings on Saturday afternoons and to abolish the indoor class.

On the motion of the President a vote of thanks was passed to the School of Design visitors and to the professional Press. A second vote of thanks was unanimously accorded to Mr. S. Pepys Cockerell for presenting to the library a copy of "Travels in Southern Europe and the Levant, 1816-17: The Journal of C. R. Cockerell, R.A."

Mr. F. D. Clapham proposed a vote of thanks to Mr. Tanner for his services as President, and to the retiring members of the Council. The motion was carried by acclamation.

Mr. Mowbray A. Green read the following paper illustrated by numerous lantern views, entitled:—

### The Architecture of Bath.

The end of the seventeenth and the early days of the eighteenth centuries saw great changes both in the life and pursuits of the people of Bath. The value of the healing waters had again impressed itself upon the minds of physicians, and several of them had written treatises upon the waters, with the result that visitors, including Royalty, came to stay in the old city. But it was cramped, dirty, and ill-fitted to receive the gentle and noble ones, who came so willingly to submit themselves to the drastic treatment which the doctors prescribed. The city was scarcely larger than it had been in mediæval days, and was full of interesting houses of the Elizabethan and Jacobean periods, many of which are portrayed on Gilmore's map of 1694. It was surrounded by walls and gates and had an area of about 37 acres. Roughly hexagonal on plan, with a long straight side to the north, it was divided by Cheap Street and Westgate Street, which ran east and west, into two unequal parts. The northernmost portion had three small alleys running north and south, and the southern portion was also divided by Stall Street, which ran due south to the south gate. All these streets are of great interest as being probably on the site of the very streets laid out by the Romans in their early city. The trade of Bath up to this time had been mostly that of woollen manufacture, and the curious T-posts shown in Gilmore's map along the borough walls on the north side probably indicate the drying poles. The only buildings of importance outside the city gates were those of Southgate Street, which ran in a continuous line from the south gate to the old bridge over the river Avon at the end, and Walcot Street and Broad Street, which ran northwards outside the north gate. Within fifty years of this period almost the whole of this charming early work had disappeared, and the later Renaissance had taken possession of the city. At the present time there remains merely a small piece of the city wall on the upper borough walls and the east gate, together with some four or five relics of the sixteenth and seventeenth centuries hidden away in different parts of the city.

Of the builders of the early years of the eighteenth century little is known with the exception of a mason called Greenway, who, with his sons, in later years carried on quite an extensive business in the making of ornamental stone vases and the like, and who in this capacity is favourably mentioned by John Wood.

One of the earliest buildings, which stood until a few years ago on the east side of Orange Grove, was Nassau House, with a façade in the Corinthian manner. The porch was preserved when the house was demolished, and may now be seen rebuilt into the wall that divides the Institution gardens from the basement of the Empire Hotel.

Of about the same date is Marshal Wade's house in the Abbey Yard, a composition of the Ionic order. The openings on the ground floor were originally arched, but the upper storey forms a poor feature and may have been rebuilt at some time. There is nothing of interest inside the house. Between the years 1722 and 1748 Marshal Wade was four times M.P. for Bath.

In 1707 George Trim began to build just outside the north wall of the city, and there still remain in this street several interesting houses. In one of these General Wolfe was staying when he received orders in 1759 to proceed to Quebec. The chief characteristic of the houses of this period is their individual treatment by a marked central feature which contrasts with the later Palladian manner when all the parts are made subservient to the general design, and where the grouping of the window openings frequently does not indicate the internal arrangements.

In 1716 Green Street was begun, and here is perhaps one of the best examples left in Bath of this period. The sashes are divided by heavy glazing bars, and though the rooms are not large, they are panelled throughout, and the ceiling is kept on a line with the underside of the window head, producing a far more cheerful and comfortable interior than was possible under the exigencies of Classic architecture.

About 1720 the south side of Westgate Street was taken down and rebuilt, and at this same period Thomas Greenway had in hand a group of houses called St. John's Court, on a piece of ground known as the Town Mixen or Rubbish Heap, and facing on the old Timber Green, known now as the Sawclose. The large house now absorbed into the theatre was at one time occupied by Beau Nash. It has projecting rusticated quoins, with a main cornice above the first floor and a high attic storey over. The lower portion of the entablature is broken above each window, but the mouldings are on the whole poor and ineffective. Adjoining it is the house where Nash died. This has a fine doorway of the Corinthian order nearly 14 feet high from the ground to the top of the cornice, and surmounted by two dies with crouching eagles above them, all the work of Greenway, and full of interest. One word as to Nash. Of a roving disposition in his youth, he came to Bath at the age of thirty and settled down to take up the post of M.C., when the opportunity offered, on the death of Captain Webster. Although it must be admitted that he greatly encouraged gaming, yet he was able to keep in check the coarse and vulgar manners of the society of his day. His end was sad, for poverty came upon him, his friends forsook him, and during his latter days the Corporation granted him a pension, and when he died buried him at the public expense.

Another work which may probably be attributed to Greenway is Widcombe House, which was built in 1727 for Phillip Bennet the younger, who afterwards represented Bath in Parliament; it is referred to as a "new mansion" in an indenture made between Bennet and Ralph Allen in 1730. The coupled Ionic pilasters have foliated caps and stand on a plinth, the capping of which also forms the top moulding of the balustrade in the garden. On the whole the elevation appears too large in the scale of its details and is set down too closely to the ground to be quite satisfactory. The interior of this house has a good staircase, and that is all.

In the kitchen-garden on the other side of the road is a little garden house with a frontage of 18 feet 6 inches, much altered, but in good preservation. The original house had three openings on the front with three corresponding alcove seats at the back and with one opening at each end. These openings are flanked by three-quarter Doric columns, and on the first floor over the two outer ones is an Ionic column. The broken entablature is a feature scarcely known in Bath. The interior of the lower room is entirely of stone, even to the cornice, and the whole of the mouldings in this little building are executed with great refinement, though internally they have never been entirely cleaned down. It is probably an earlier building than Widcombe House. Near the stables is the old dovecote, rapidly going to decay.

Among the builders of this time should be mentioned William Killigrew, who built the chapel at St. John's Hospital and a group of houses at the back of St. James's Church, two of which still remain.

We are now at the period when John Wood began his work in Bath. He was born in 1704, but little is known of his early life and training; he was a Yorkshireman, but the influence which attracted him to Bath, unless it was the chance meeting of Ralph Allen in his own county, is not apparent. Certain it is that at the early age of twenty-one he had large ideas as to the rebuilding of Bath, but he was not successful in bringing it about in the way he then intended. One of his first definite works in the city was the building of the upper part of St. John's Hospital for the Duke of Chandos in 1727, a hospital founded for the reception of six poor men and six poor women. The two sides facing the courtyard are treated without ornament, and are finished with a crowning cornice of the usual modillion type. Quite close to this is another group of houses known as Chandos Buildings, erected by Wood in 1727 for the Duke of Chandos.

In the early part of this same year Wood was also engaged upon the rebuilding and enlargement of a house in Lilliput Alley, or North Parade Passage. The house was probably a seventeenth century one, and was owned by Ralph Allen, the pioneer of the cross post system of letter carrying. The well-proportioned front, with its rusticated basement, Corinthian order, and pedimented roof, was an addition to the old portion of the house, which latter he refronted. There are features and details here very unlike Wood's later work, but it may be that he had not entirely settled in Bath, for he had been living on and off in London for two or three years between the time of his leaving Yorkshire and his finally coming to

Bath, and it was evidently the custom of the period to allow the builders a fairly free hand in the execution of their work.

In spite of many disappointments he at last succeeded in starting, in the year 1729, a square just outside the north-west boundary of the city, and this he called Queen Square in honour of Queen Caroline, wife of George II. The land he leased from Mr. Gay, a surgeon in Hatton Garden, on a tenure of ninety-nine years, and he let it out again to builders on leases of ninety-eight years. Starting on the east side, the buildings gradually crept round by the north or principal front, and, including St. Mary's Chapel, were finally completed on the south side in a period of seven years.

The scheme as originally planned shows Wood Street, named after himself, as 90 feet wide, but this was afterwards reduced by one-half, and the square, as completed, measured 316 feet from north to south and 306 feet from east to west, reckoning from house to house. The gardens in the centre of the square, as well as the areas of the houses, were surrounded by a stone balustrading, with either openings or gates in the centre of each side of the gardens, but by 1790 the balustrading seems to have disappeared and iron railings have taken its place. Some of it may, however, still be seen on a wall in Lyncombe Vale, where it was put up at the beginning of the nineteenth century. Part of that round the houses existed, however, as late as 1819.

The principal side of the square is that on the north, where a rusticated ground-floor storey supports a Corinthian order, which runs through the first and second storeys, the centre and two ends being slightly projected and having three-quarter columns, while the intervening parts have pilasters. The sills of the first-floor windows have all been cut down and their proportion thereby marred. The level of the original sills is shown by the flat course on either side of the windows. The centre and end blocks had quite a super-abundance of rich detail even up to the attic course, but this could only have been seen when it was newly carved. It certainly points to the fact that the builders had at their command a large amount of skilled artisan labour. The façade was very ably designed to accord with the internal planning, though there have been many alterations in later days, either by turning doors into windows or windows into doors. The plans of the centre house give us some idea of the manner of life at that time, for we see that it was customary not only to have bedrooms on the ground floor, but to plan the houses with rooms so entirely *en suite* as to make them quite unsuitable for the customs of a later generation. In this case the interesting doorways which have been cut through into the back bedrooms on the first floor will show that that storey was evidently designed largely with a view to providing reception rather than bedroom accommodation. The attendants' rooms at the further end of the garden were probably used as waiting-rooms by the chairmen, who brought their fares to call at the house, and the under-part of the room on the right side of the house seems to have been constructed to take the Sedan-chairs, while the staircase itself was specially contrived with a circular end so that patients who came from the baths might be carried straight up to their rooms before getting out of the chairs.

Many of the ceilings at this time were panelled in plaster, but the decorative low relief enrichments of foliage and other conventionalised natural forms had not yet come into general use. The charm of the house is the staircase, and the finest one in Bath is to be found in the house on the west side of this square. The handrails, newels, balusters, and dado are all of Spanish mahogany; the newels are worked as fluted Corinthian columns, and the baluster caps are partially enriched. There are, as usual, three balusters to each tread, and the stairs themselves are formed of pieces of oak dowelled together so as to form solid steps; these are moulded underneath and enriched on their outer ends, and there is a double strip of mahogany inlaid on the treads. The quarter space landings are also inlaid. At the bottom of the stairs is a lazy-tongs gate of mahogany, to be used if necessary to prevent dogs from going upstairs.

The west side of the square was originally completed with three detached piles of buildings, the centre one being set back a considerable distance with a large forecourt in front.

(*To be concluded.*)

The Birmingham education committee last week approved the sketch plans submitted for the proposed Council school to be erected in Cherrywood Road, Bordesley Green. The school will consist of two self-contained blocks and accommodate 500 each in the junior and senior departments. The estimated cost is 10,379*l*. for the school buildings, 1,000*l*. for the manual room, and 450*l*. for the caretaker's house.

## BUILDING BY-LAWS.*

(*Concluded from last week.*)

But though dwelling-house walls may be thus slighted there is one wall over which, as far as I know, all by-laws exercise most scrupulous care—the wall of the ashpit. Numerous by-laws that allow human beings to shelter themselves in dwellings of nothing more substantial than corrugated iron, weather-boarding, or lath and plaster, insist upon ashpits being enclosed by nine-inch brick walls. The solicitude of rural district councillors for other men's ashes—I mean the ashes of the domestic hearth—is quite touching. To complete the absurdity of such provisions, surely there should also be rules as to party-walls of ashpits, bay windows of ashpits, and ashpits of two or more storeys.

This small domestic appurtenance, whose functions with general advantage and economy are usually usurped by a movable tin box, is a subject upon which the official mind dwells lovingly but hardly consistently. In South Stoneham an ashpit may be as near as 6 feet to a dwelling-house, but it must be 30 feet from a well. In Southampton Borough, 6 feet from a house and 50 feet from a well. In Godstone, 10 feet from a house and 50 feet from a well, and so on.

Ashes, perhaps, have earned this respect by a hitherto unsuspected and mysterious quality of elasticity. In the Winchester Rural District a month's ashes are credited with a bulk of 20 cubic feet, but in the Farnham district, almost adjoining, a fortnight's ashes have the same, according to the official estimate. Ashpits of a capacity sufficient to contain this amount of refuse do not seem any too spacious—5 feet long, 2 feet wide, and 2 feet deep; but they are considerably more roomy than those allowed in Bodmin and other places where their capacity is limited to 6 cubic feet—24 inches long, 24 inches wide, and 18 inches deep. But in Bodmin, ashpits are evidently valued for other qualities than mere size. No less than eight paragraphs deal with the fascinating subject of their construction, requiring not only 9-inch walls (which, with their footings, would exceed in bulk the ashes they enclose), but also a roof, a floor, a ventilator, and a door. As to the last I quote here the actual words:—"A door in such a position and so constructed and fitted as to admit of the convenient removal of the contents of such ashpit, and to admit of being securely closed and fastened for the effectual prevention of the escape of any of the contents of such ashpit."

One might almost suppose it to be the custom in Bodmin to use the coal-cellar as a crematorium.

In Knight's "Annotated By-laws" there is a delicate note of unconscious sarcasm, after critical examination of these regulations:—"The ashpit will be reasonably substantial."

The rules as to cesspools, &c., have just the same haphazard inconsistencies. In one district they must be 70 feet from a house, while in another 40 feet is far enough. Why in Southampton may they not be within 100 feet of a well if in West Ham it is safe for them to be as near as 40 feet? If a distance of 50 feet is safe in Petersfield, why is less than 60 feet unsafe in Godalming? Differences of subsoil do not account for these discrepancies, for most districts have various kinds.

Air-spaces and paved areas vary, too, just at the whim of the person who is responsible for the by-laws of a district. Why should an air-space of 300 feet be required in Clare, 250 feet in Alresford, and 200 feet in Alton, while 150 feet will suffice in Guildford and most other places?

A peculiarly absurd by-law is one which in some districts prohibits rooms with sloped ceilings of a less height than 9 feet over half their floor area. In most districts 8 feet is allowed, and even that requirement defeats its own end if we may assume that to be the prevention of cramped attic bedrooms, for ingenious builders, when threatened with fines for having constructed less than half the attic of the required height, get out of the difficulty by partitioning off enough of that part of the room over which the roof slopes to reduce it to less than half the total area, thus actually decreasing the cubic air-space of the apartment. In Tynemouth an average height of 6½ feet is specified as sufficient.

In a German code of by-laws, however, I find a more grotesque piece of legislation with regard to the height of rooms than any English code can boast. It is this. In towns with a population exceeding 10,000 rooms must be at least 8 feet 9 inches high, but in towns of less than 10,000 they need only be 8 feet 1 inch. A very superficial view might find an apparent reason for this in the presumable crowding of buildings in the larger towns. But how about the growth of towns? Towns expand by streets radiating more or less from a centre; and in a growing town it would suddenly be found that the population having reached 10,000, all the new houses, although less likely to be crowded the further the street extensions progressed, must have higher rooms than those in the older part of the town, so that eventually all new towns that attained a population of over 10,000 would have a central area of low-roomed buildings surrounded by a ring of higher ones. And possibly even a precise German official would find it difficult to decide exactly when the population of a town reached the stated figure and new ceilings were to be put up 8 inches accordingly. Besides, populations fluctuate, and one can imagine builders in a town of about 10,000 inhabitants would have an anxious time.

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* A paper read before the British Constitution Association on April 25 by Mr. R. M. Lucas, F.R.I.B.A.

Compliance with the demand for a height of 9 feet in the bedrooms of small cottages—bedrooms on the ground floor may be 8 feet, by the way—besides leading to a reduction of the floor area and cubic contents, also either weakens the roof and walls or increases the cost. At the same time there is nothing, as far as I know, in the by-laws to protect the public against the dangers likely to be caused by the spreading tendency of a roof, nor, for the matter of that, is there anything about the thrust of arches except those over fire-places. It is hard to see how, in the face of such omissions, it can be argued that by-laws are necessary to ensure good building or even to prevent dangerous building.

Many districts have rules specifying windows of a certain size, or rather of an uncertain size, seeing that different districts do not always agree; but these well-meant attempts will hardly achieve much success without the prohibition of blinds, curtains, and sash-fasteners. One by-law minutely specifies the precise length of slate-nails, but has nothing to say about the thickness of the battens the nails are to be driven into.

It would be easy to collect many more cases in which the by-laws are not only inconsistent with common sense but with each other, and also to show how their administrators differ in the interpretation of them, as, for instance, with regard to cement concrete, which one surveyor has wisely used in place of brick footings, while in an adjoining district it is disallowed upon the advice of an official who actually told his committee in my hearing that cement concrete must not be used instead of ordinary footings of bricks laid in mortar, because, he asserted, it had not sufficient crushing strength until twelve months had elapsed to support a cottage wall! But having, I think, shown how the by-laws discredit each other by their inconsistencies and absurdities, I want also to show that it cannot be claimed for them that they are necessary to improve building.

One illustration will suffice, though many could be given. It is that of the hollow wall.

Anyone who has lived in a district where the local clay produces absorbent bricks will agree with me that no greater improvement in house building has taken place for many years than that of building the external walls with a vertical cavity of about two inches across which damp cannot pass. The inner half of a wall so built is dry, for it is connected to the outer rain-soaked half only by iron wall ties which are shaped with a bend to prevent water passing; whereas a solid external wall, unless protected, is anything but rainproof if the bricks are porous, as on the south coast even the best bricks are, they being very heavy drinkers, quite different to those used in London. Now, no by-law would meet with more thorough approval, would inflict less hardship, and would be more in the public interest, than one requiring all dwelling-houses faced with porous bricks to be built with hollow external walls. Yet no such by-law exists, and though some codes have references to hollow walls they are only for cellars or merely permissive, while in at least one district the absence of such references used even to be put forward as a hindrance to those who desired to build dry houses in this simple way. Surely only one deduction can be drawn from the fact that a by-law which certainly would be as little open to objection as any has never been made, while even the most abandoned jerry-builders act as if it were in force. This undoubted improvement has come about quite naturally without any help from the by-laws; and although the hollow wall costs a little more to build, and is an improvement that does not show when the building is completed, it is now invariable even in the cheapest cottages in the south of Hampshire and elsewhere. Besides being drier than a solid wall it is also warmer, owing to the non-conductivity of the air in the cavity, and quite as strong, for though having a weaker bond it has a wider base.

When public officials assert that by-laws are necessary, it never seems to occur to them that, allowing for the advance of science and general knowledge, no better building is done now than that which was done before the by-laws came into vogue. Nor can they explain why if by-laws are necessary in some districts, in other similar districts there should be none—an omission for which nobody seems a penny the worse; nor why, if worthy to be upheld, they should present such amazing contradictions in distinguishing between things to be approved or disapproved; nor why, again, the winning design in the Letchworth Garden City Cottage Competition should be prohibited by the regulations enforced by scores of rural district councils.

The building by-law system is in reality bound up with the great townward movement, with the congestion of hurry and rush. It was so in London when the Great Fire reduced the City suddenly to a vacant building estate—to an estate so "ripe" and so "eligible" that without a regulating code of by-laws the scramble of builders would have resulted in utter confusion. Jerry-building, by which term I understand not temporary building, nor economic building, nor speculative building necessarily, all of which may be quite good and desirable in their way, but building in which dishonest economy is the leading motive. Jerry-building is a fraudulent act and should be treated as such, but the by-laws aimed against it have struck down one not very widespread evil to raise up others, permitting favouritism, corruption and bribery, and giving opportunities to petty officials to indulge personal spite. Even where honestly and intelligently administered the rural by-laws are admitted to have discouraged the building of new cottages, thus indirectly driving men from the fields to the towns. The mere fact that in some districts a man finds he has to obtain and part with two complete duplicate sets of plans, sections, &c., of a proposed building; two plans showing the site and neighbouring properties (which may mean paying for quite a large survey); sections of land and drainage details, before his application for permission to put up a cottage will even be considered, must act as a deterrent—and it does.

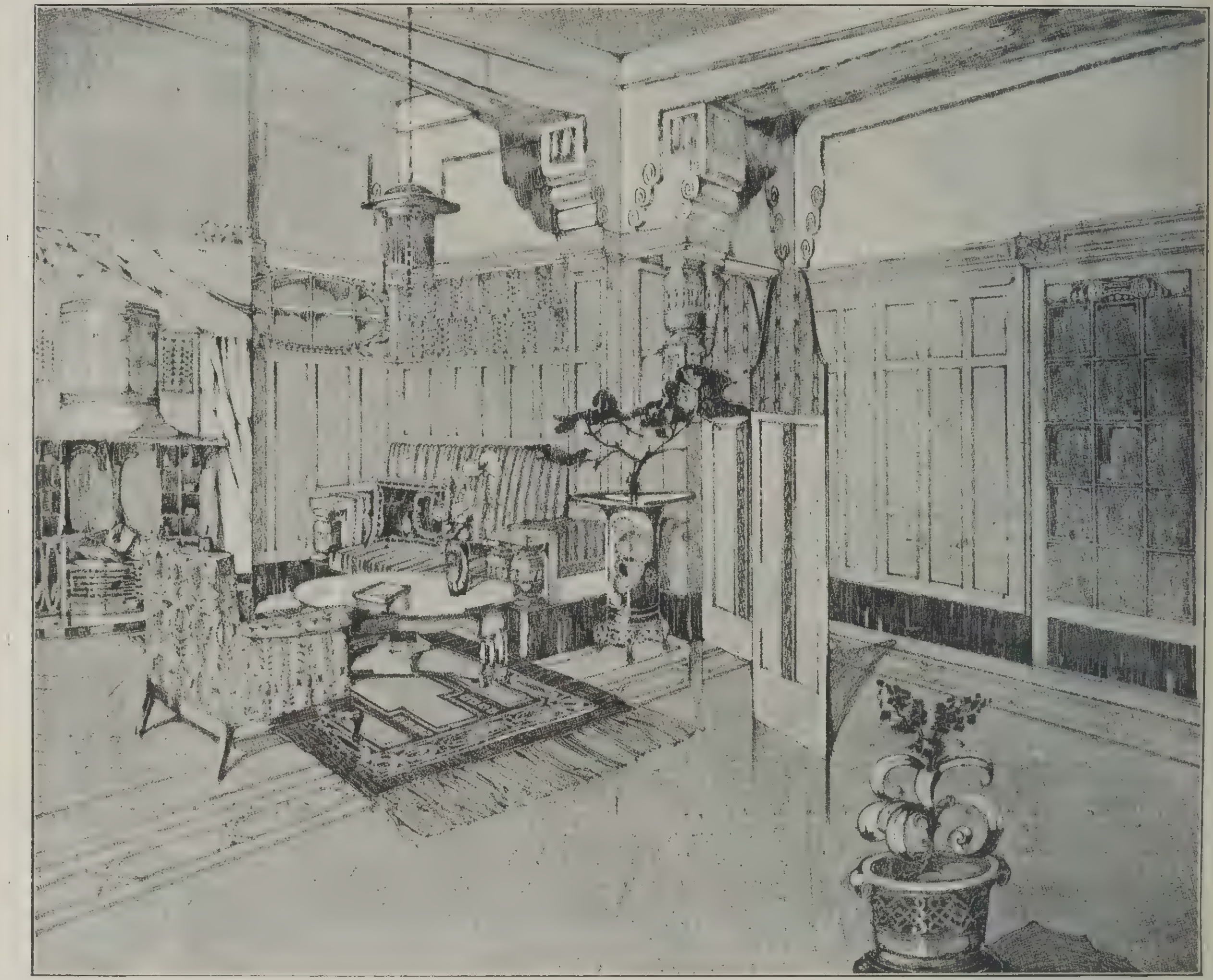
This demand for duplicate detailed plans in advance of the work is hardly consistent with the principle of English law, according to which a man is regarded as innocent until proved guilty.

But although, as we have seen, the building by-laws, or, at any rate, those in force in some villages are anything but advantageous to the community generally, there is one class of individuals to whom they are the very staff of life. I refer not to the honest and properly qualified surveyors, but to others who, with little or no training, have secured their snug permanent berths by trading upon the good nature, the laxity or the cupidity of newly-elected councillors elated at finding themselves for the first time able to dispense favours at the expense of the public. Surveyors of this type see the red light in any suggestion of reform. They have no desire to return to their former occupations—to become again road-menders, lawyers' clerks, bootmakers, &c. In the view of officials of this class the more by-laws there are the better. They find in each vaguely-worded regulation a handy weapon with which to browbeat bewildered builders. They like to have the exercise of discretionary powers which can be made so useful in favour of their friends and against their enemies, not to say so profitable to themselves.

Even among public officials of the best class a tendency to support the system that supports them is almost inevitable. They all float together as timbers of one bureaucratic raft. Though they may be conscious of having honestly earned their positions, they know full well that others to whom they wish no ill would have a hard time if cast adrift. Consequently one must expect by-laws to be accepted as necessary by those whose administration of them is their means of livelihood. Against this view, however, we have not only the two main facts—namely, that building was as good before as after the adoption of the by-laws, and that there are still districts that neither have them nor want them; but other facts, equally clear but of less argumentative importance, such as the restriction upon building enterprise and employment, the preliminary expenses and delays confronting those who wish to build, the restrictions upon justifiable experiments with new methods of construction—an asphalte roof, for instance, being forbidden in one district upon the excuse that the by-laws did not mention it; the power placed in the hands of officials sometimes grossly ignorant of the A B C of their duties, to persecute or favour, to share profits with some and to levy blackmail on others, and the absence of any means of deciding if a building may be erected in a certain way except by taking the bold course of erecting it at the risk of having it pulled down.

Reviewing the by-laws, however, as for the time being a fixed institution in many urban and rural districts, we find

## MODERN EUROPEAN ARCHITECTURE.
### HOLLAND.



[From *Het Huis*.

HALL IN A TOWN HOUSE.

numerous points on which they might be improved. The public have at least a right to expect a good system of arrangement and publication and a uniform charge, if any. Rules of one district should not contradict those of the next, for the credit of their makers if nothing else; the administration should be strictly controlled; no unnecessary discretionary powers permitted; and a builder should be granted some means of proving his right to build in a certain way without having actually to build.

But it appears to me that there is some hope for the evolution of a better state of affairs if it can be found possible for the more open-minded of the urban and rural surveyors to co-operate with landowners, architects, builders, and all who are alive to the evil of the continued migration from the fields to the towns. First, however, we must be in agreement upon one point—namely, that a man has the right to the same liberty in building that is allowed to him in other matters, liberty restrained only by regard for the public welfare and equal liberty for all. This is emphatically not the case at present, and a radical change is needed before it can be brought about.

The complete abolition of all building restrictions would not produce it, for, though they are only a small minority, the unscrupulous builders—the jerry-builders, in fact—would be able to injure the honest by dishonest competition. Nor would one simplified uniform code of by-laws for all urban and one for all rural districts, though an improvement on the confusion of existing codes, suffice to bring it about, for, apart from the many indefensible differences there are a few local considerations which, if unobserved, would cause hardship. Nor would the issue of fixed sanitary rules, with discretionary building rules, be satisfactory, for this would increase an evil, that of discretionary power—quite serious enough in some districts as it is.

The radical change which I hope may be seen is this. To replace the present punitive character of the by-law administration by an educative one; to give the officials more power to instruct and less to punish.

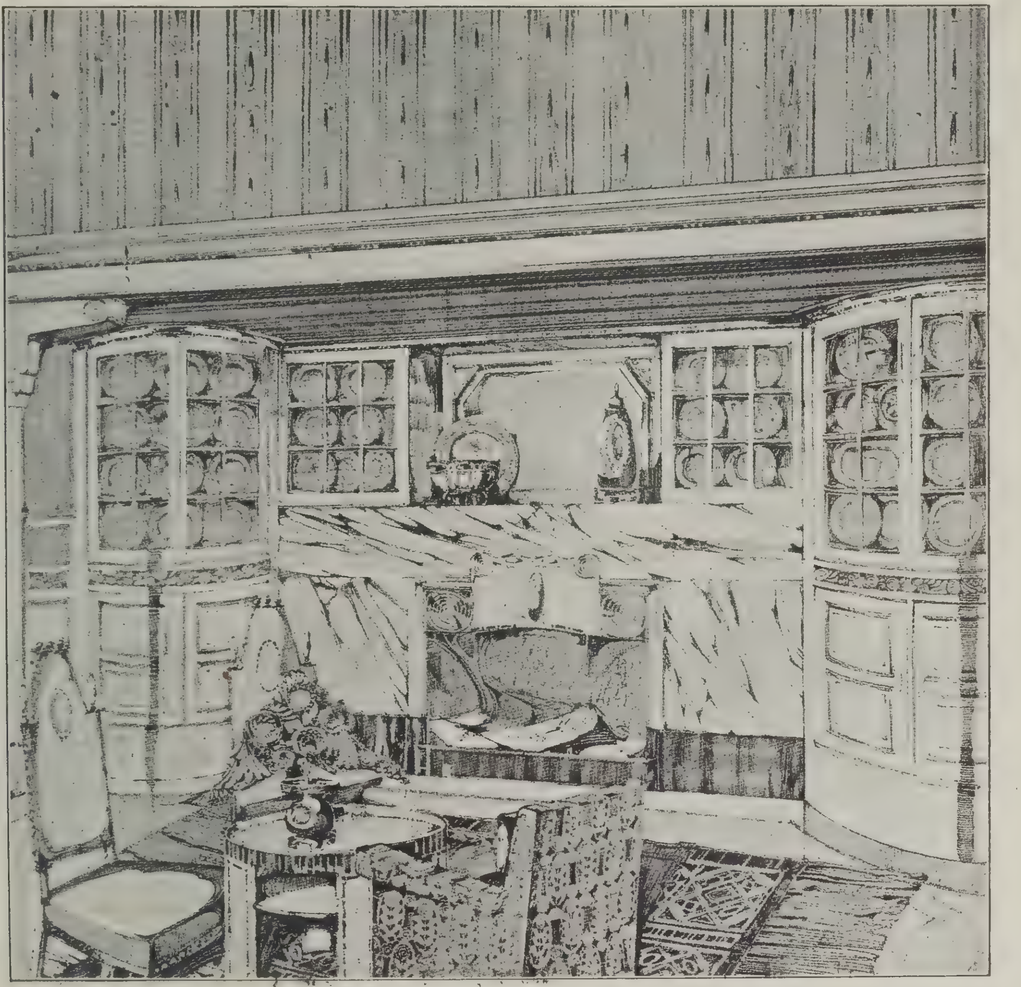
It is an easier thing to suggest a psychic reform than to state it in practical terms. No one is more aware than I of the hopelessness of trying to make useful public servants out of hardened officials who have lived in their grooves for years—and they know it too, but at least they would be comparatively harmless under changed conditions. Nor do I fail to see that for a time the want of intelligent co-operation amongst the officials, the builders, and the public might cause partial failure. But, nevertheless, I believe a change for the general benefit is possible.

Some years ago I put forward a few suggestions of the lines on which a reform of the building by-law administration might be worked out by those who are skilled in such matters. The scheme is outlined in reference only to rural building, for the present system acts most harshly in country districts, and it does not refer to the sanitary by-laws which would remain in force, being, of course, revised as knowledge advanced.

The first suggestion is that instead of having to submit plans to district councils, to observe their building regulations, to await their delays, to submit to their decisions, and to pay their fees, fines, &c., all persons desirous of building (whom for brevity I will call builders) should merely have to notify their intention to build, describing the site, and to apply for a schedule of building instructions. This schedule might be kept up to date by being issued in the form of leaflets similar to those admirable ones supplied by the Board of Agriculture to farmers. Compliance with these instructions would be, while optional, obviously desirable, and any class of building might be erected in any way that the sanitary by-laws, the Public Health Acts, and the Common Law of the land would allow. The district surveyor should be accessible to builders to explain and to advise upon the

## MODERN EUROPEAN ARCHITECTURE.

### HOLLAND.



[From *Het Huis.*

AN INGLE IN A DINING-ROOM.

instructions, and he should examine the site and the foundations and drains ; he should also be free at all times to inspect work, but not to interfere with it.

Upon completion, and before the building could be occupied, the surveyor should make a report upon it, and his report, favourable or otherwise, should be displayed to intending tenants, purchasers, or mortgagees. As regards essentials, a house can be very easily described—in matters where certainty is possible, that is, for no one can absolutely guarantee against the blistering and cracking of plaster, the shrinkage of joinery, or the dry-rot of timber, as these defects sometimes do not show for months after a perfectly honest completion of the work. The certificate of merit or demerit need not therefore extend to more than a few lines, for example :—"This house is equal to the average of its class in being built with good bricks, mortar, tiles, and timber, with other things in character, except that the eaves-gutters are unduly light and fixed with weak screws, thus being likely to require early renewal."

A right of appeal against the surveyor's report, on reasonable conditions, should of course be granted to the builder.

Only work actually unsafe or liable to become so without warning should be pulled down.

I believe that under a scheme of this kind it would be possible to encourage honest builders, to checkmate dishonest ones, and to instruct both classes and the public at the same time, without interfering with the experimental adoption of newly-invented materials and methods of construction.

It is too much perhaps to expect that any district council within whose area a code of by-laws is already in force will be found willing to put this scheme to a test ; but might it not be tentatively adopted by one which is still unfettered? The experiment would not be difficult to make nor costly, and it would be quite non-committal. Much, of course, would depend upon the surveyor ; but I do not think an intelligent and well-trained man could fail to appreciate the more worthy field laid open to his knowledge and skill.

As things are now, a builder has to make expensive and irksome applications to obtain the permission of persons who generally have no interest in his affairs to do what he has a born right to do, for who will assert that if a man possess the right to plant a tree or dig a well, to paint a picture, or write a book, even to make inflammatory speeches in Hyde Park, he has not an equal right to build a house provided that in doing so he injure no one? A reform on the lines I have suggested would restore that right which statutory law has encroached upon, and at the same time would assist in making a sensible use of it. For that right I feel it a privilege as well as a duty to plead.

Sir William Chance, the Chairman, in opening the discussion, said that a certain amount of evasion of the by-laws was possible. For instance, according to the plans submitted for approval, a room must have a certain amount of window space. In some cases this might be extremely inconvenient. The difficulty could be surmounted by putting on the plan the window of a size desired by the owner, and in addition a small additional window which would bring up the area to the compulsory limit. After the building has been passed the second window can be filled in. Such a course was bound to be taken when building by-laws interfere improperly as at present. He did not suggest that all district councils were unreasonable, and some were anxious to get out of existing regulations; but they found the greatest difficulty in doing so. Sir W. Chance dealt at some length with a Bill which had been drawn up by an association specially for reforming the by-laws. It was called the Public Health Act (Building By-laws) Amendment Bill, and had been passed by the House of Lords in 1906, with the concurrence of Lord Carrington, but it was stopped by the House of Commons. It was believed that if the Bill were passed it would render existing by-laws less unjust, and without interfering in the least with sanitary requirements. It was proposed that an owner should be allowed to erect a detached building just as he liked so long as he did not infringe any of the Public Health Act clauses.

Another thing which they hoped would make things easier than at present was the provision by which any matters in dispute could be brought in a friendly action on the plans, instead of the sanitary authority waiting until the building is complete. In the latter event there is an enormous expense and money wasted, no matter which side may win. The suggested measure appeared to meet the rights of all sides, but, as already said, it had been stopped by the Commons, which fact should be remembered when they heard so much about the House of Lords stopping all good legislation.

Mr. Geo. Hubbard, F.R.I.B.A., said that he had very much pleasure in proposing a vote of thanks to Mr. Lucas for a really clever, interesting, and amusing lecture. He had shown many absurdities and incongruities in the by-laws of various urban districts. The absence of common sense, which inspired certain by-laws, had been brought home to him on various occasions, and as an instance he would mention the experience of his firm (Hubbard & Moore) in connection with a house built for a client who afterwards wished to have a billiard-room. Plans for the house were prepared and submitted to the Urban District Council. Subsequently plans for the billiard-room were sent in and shown to project 18 inches in front of the house. The client was in a hurry, and the works were begun before the plans had been approved by the Council. The urban district surveyor viewed the trenches, footings, and walls, and approved of the work from time to time. When the walls had been carried up to the wall-plate of the room the Urban District Council notified the architects, for the first time, that they objected to the billiard-room as it projected in front of the building line, and they ordered it to be set back.* Seeing that the work had been passed by their surveyor from time to time, the architects did not feel justified in pulling it down. In due course a summons was served, and the magistrate ordered a fine of 20*l*. This fine was paid, the works continued, and again the architects received notice to set back the billiard-room. Solicitors were consulted and counsel's opinion obtained; the opinion was that no Court could upset the order of the District Council, and in the end the billiard-room was pulled down and re-erected in the required position. The technical objection was that the building interfered with the current of air down the road. The road was 40 feet wide, and the building line was some 30 feet away from the road, and there was not another house on the billiard-room side of the house for a quarter of a mile or more; the technical objection was vexatious to the architects, expensive for the client, and of no advantage to the public. Mr. Hubbard pointed out that the London Building Act provides that the area at the back of a house must be of the full width of the site.† In the case of terrace houses round a crescent road it is impossible to have the radiating sites as wide at the back as at the front, and where this regulation is enforced it is impossible to build terrace houses on more than one side of the crescent road. There appeared to be a passionate desire on the part of some to be allowed to do exactly as they pleased and to achieve a state of independence which was not subject to any controlling power. On all matters which affected the welfare of the community there could be no question other than that the individual had to bear certain obligations so that he might share in the common advantage. For the benefit of the community every house should be constructed so that it conformed to a certain standard in respect to its sanitation and also in its construction, so that it should not be a source of danger to others in case of fire and in many other matters which conduced to health.

Mr. Mark H. Judge, A.R.I.B.A., seconded the vote of thanks to Mr. Lucas. He thought the lecturer had shown to what an extent the superstition of State control had got possession of the public mind. It was interesting and instructive to be told that building by-laws were introduced as far back as the Fire of London. This showed what an old thing State interference was. The tendency of the time in favour of State regulation was in fact a retrogression and not an advance. We need only such regulations as are necessary to make clear the common law as to construction and sanitation. Personal responsibility should be brought home to the architect, the builder, and their client. It is no more the business of the local authority to provide an architect than it is to provide a lawyer in the matter of title, or a doctor in case of illness. It is to increased individual responsibility that we must look for improvement in building, rather than to increased interference on the part of public authorities.

The Hon. Ernest Pomeroy said that, judging from an experience of his own, Mr. Hubbard's client need not have pulled down the billiard-room to which objection had been taken by the Urban District Council. His own case was of a somewhat similar nature, and he took it on appeal to the High Court, where it was decided that although the building by-laws might be reasonable in themselves, yet they were unreasonable for that particular building. It was probable that if Mr. Hubbard had taken the matter to the High Court the Judge would have referred it back to the magistrate. On another occasion the local authorities took objection to a wooden lodge erected by Mr. Pomeroy, and, after due notice, sent men to pull it down. But these all ran when he appeared with a shot gun to defend his property, and the wooden building still remains. He failed to see why there should be any by-laws at all, or why people should be prohibited from using their own discretion. Supposing that a man's health became affected by living in a house that had been erected of such materials as to cost only 100*l*., he would have money to spare from his economy in building which he could spend for food, clothing and in other ways, while he might have been half starved by extra cost in building. As a matter of principle it was wrong that the State should interfere except by means of the common law of the land. There was no need for any by-laws.

Mr. Thackeray Turner, F.R.I.B.A., pointed out that the moment you make a building by-law you are inducing a house owner to take your minimum and not your maximum, so that in time the former becomes the latter.

Sir William Chance doubted whether a good Public Health Act would not settle all the difficulties. Many people think that the present law is sufficient without any further additions being made to it by means of by-laws. He himself did not feel prepared to go as far as Mr. Pomeroy in asking for by-laws to be abolished. In a town, for instance, one could not allow every person to drain their house just as they pleased. It was, however, absolutely absurd and ludicrous to have like by-laws in the country, but there must be by-laws of some sort and some authority to decide questions that arise out of them.

Mr. Russ thought that there was a great deal too much interference with the liberty of those who want to build. By-laws are necessary in so far as they take steps to prevent the spread of fire from one building to another and to insure hygienic conditions. This could be done under the Public Health Act. The smaller class of houses are at present overrun with sanitary inspectors who become a perfect nuisance to everybody.

The vote of thanks to Mr. Lucas was passed with acclamation, and after he had replied to the discussion the meeting closed with a vote of thanks to Sir William Chance for presiding.

## OUR CONTEMPORARIES FROM OVER-SEAS.

"La Construction Moderne" (Paris) commences a series of illustrations of the big stores "Magasins au Printemps" in Paris, of which M. René Binet is the architect, and which is chiefly remarkable for the architect's internal treatment of the constructional ironwork combined with decorative balustrades, &c.

*Arkitektur og Dekorativ Kunst* (Christiania) describes and illustrates the Natural History Museum at Töien and the Norwegian Bank at Christianssund, and illustrates a number of students' designs for a music pavilion or bandstand.

*Der Architekt* (Vienna) has a descriptive article with illustrations of the town of Rattenberg on the Inn, where there is much quaint old architecture. Amongst the illustrations are a school and burgermaster's offices at Mauerbach, by Herr Josef Hofbauer; the first premiated design for a new Rathaus at Mährisch-Schönberg, by Herren Karl Badstieber and Eduard Thumb, rational and picturesque; and a weird new-art design for a small theatre, by Herr Stwertnik.

*Zodtchy* (St. Petersburg) has some excellent illustrations of work by MM. V. & G. Cossjacoff, which, if a little mixed archæologically, contains some charming detail.

*Engineering Record* (New York) gives a paper read by Mr. C. R. Young before the Convention of the Canadian Cement and Concrete Association, describing the results of his investigation of certain failures of concrete bridges.

The Exeter city surveyor has been instructed to prepare plans for erecting a refuse destructor at the St. Thomas sewage works.

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* *Vide* Public Health Act, 1875, s. 156.

† *Vide*, s. 41 (11), L.B.A., 1894.

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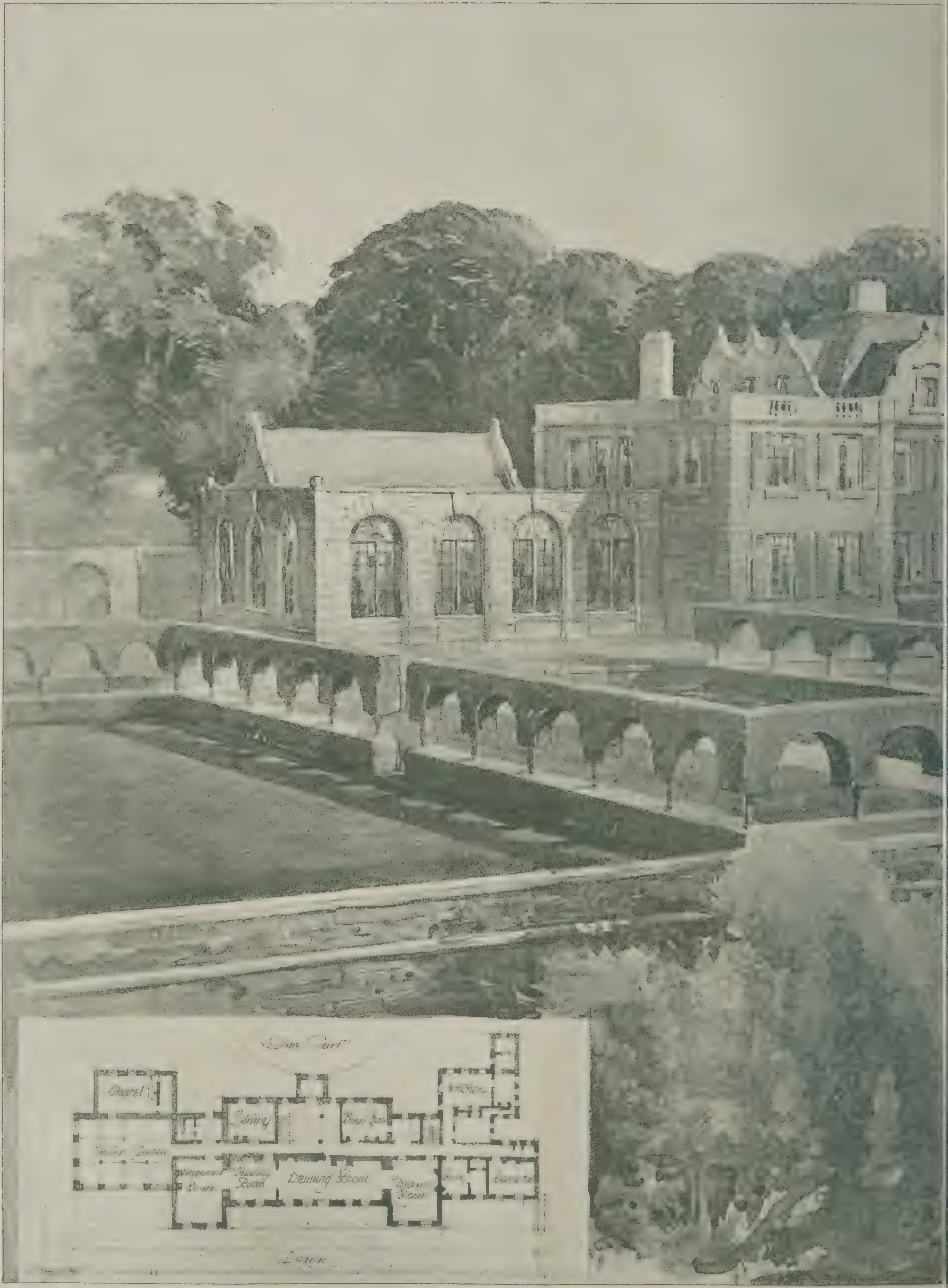

*Royal Academy Exhibition, 1910.*

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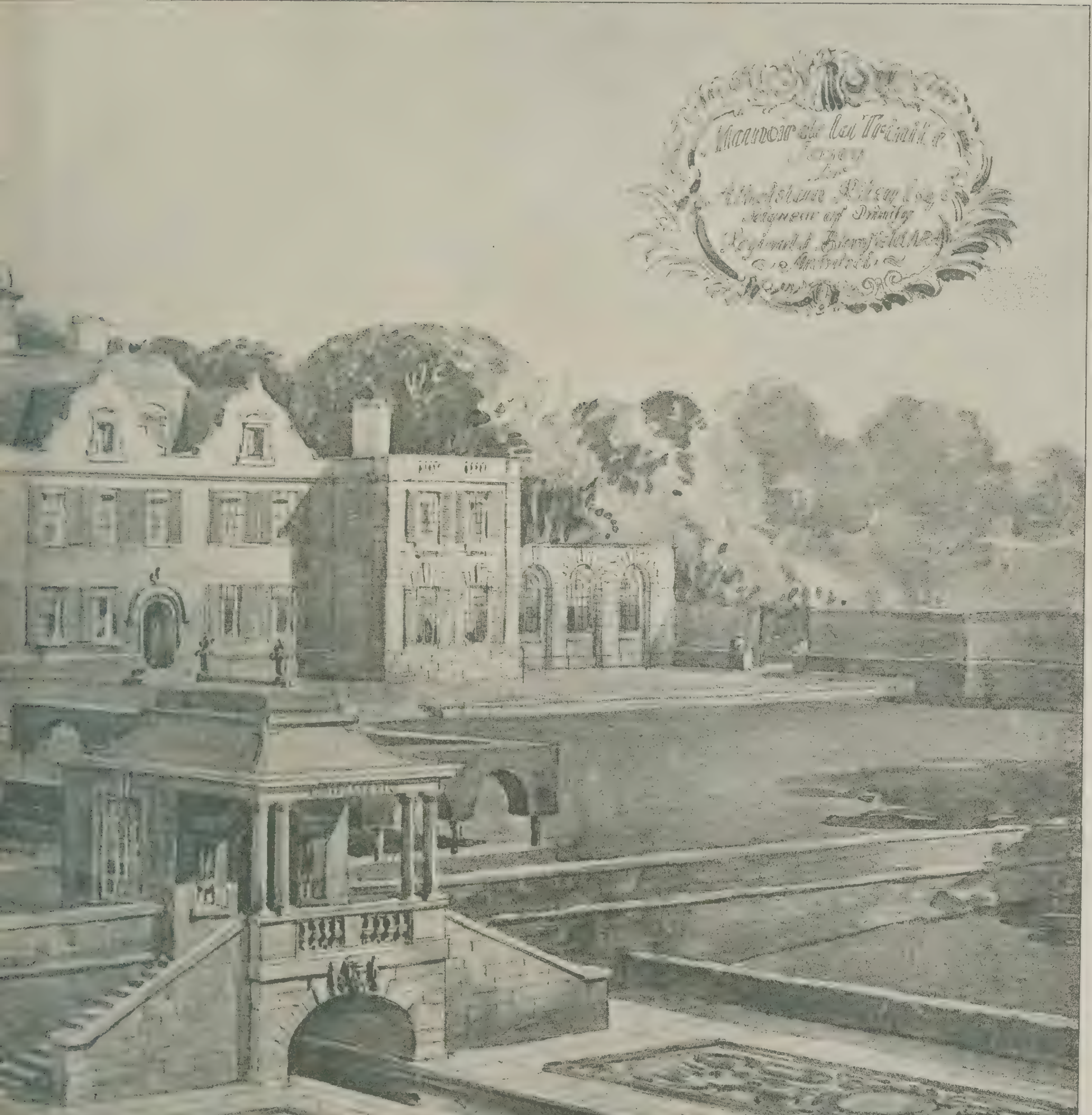

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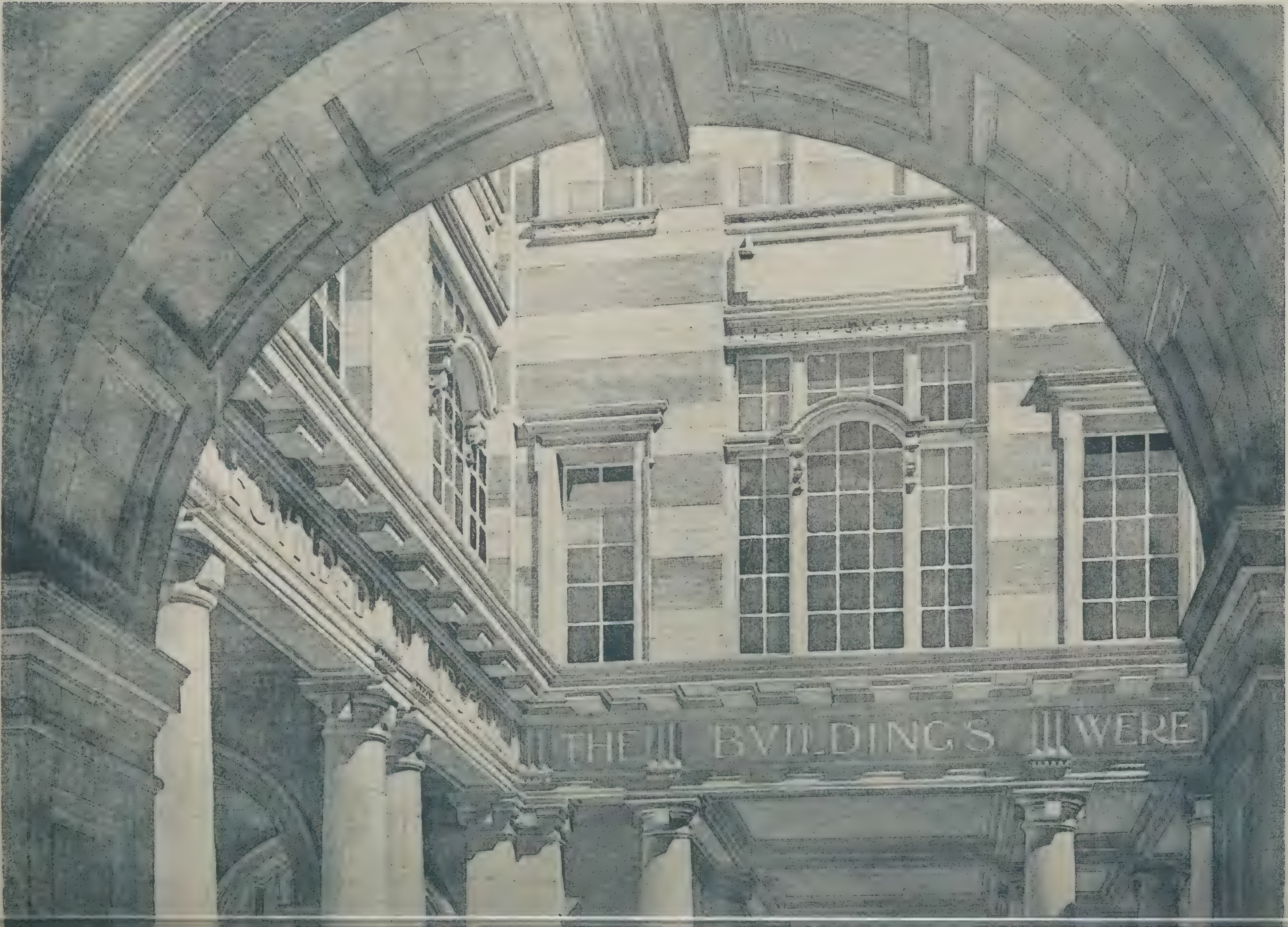
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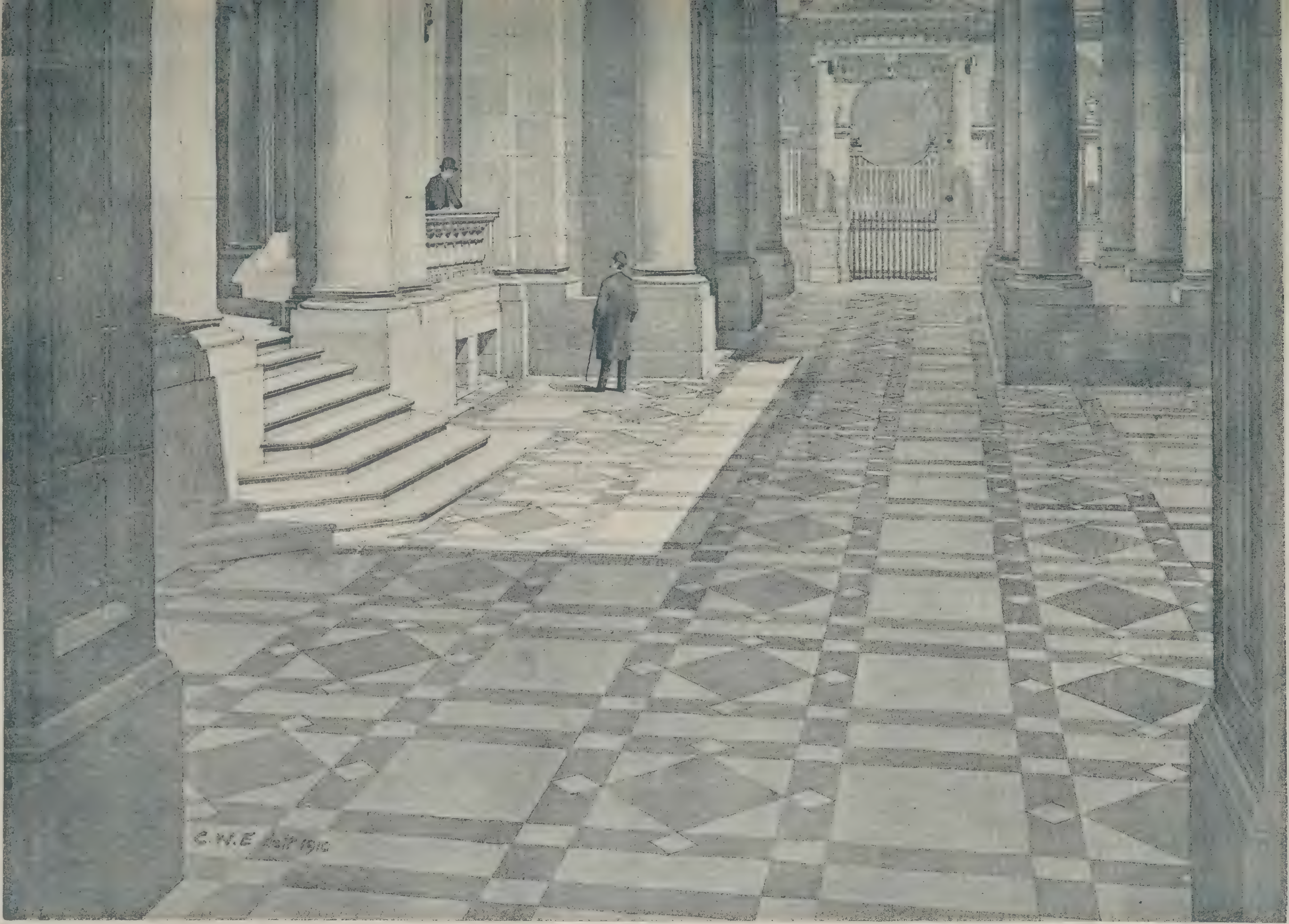

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REFUGE ASSURANCE COMPANY'S BUILDING, MANCHESTER: VIEW OF THE COURTYARD.

Mr. PAUL WATERHOUSE, F.R.I.B.A., Architect.

*Royal Academy Exhibition, 1910*

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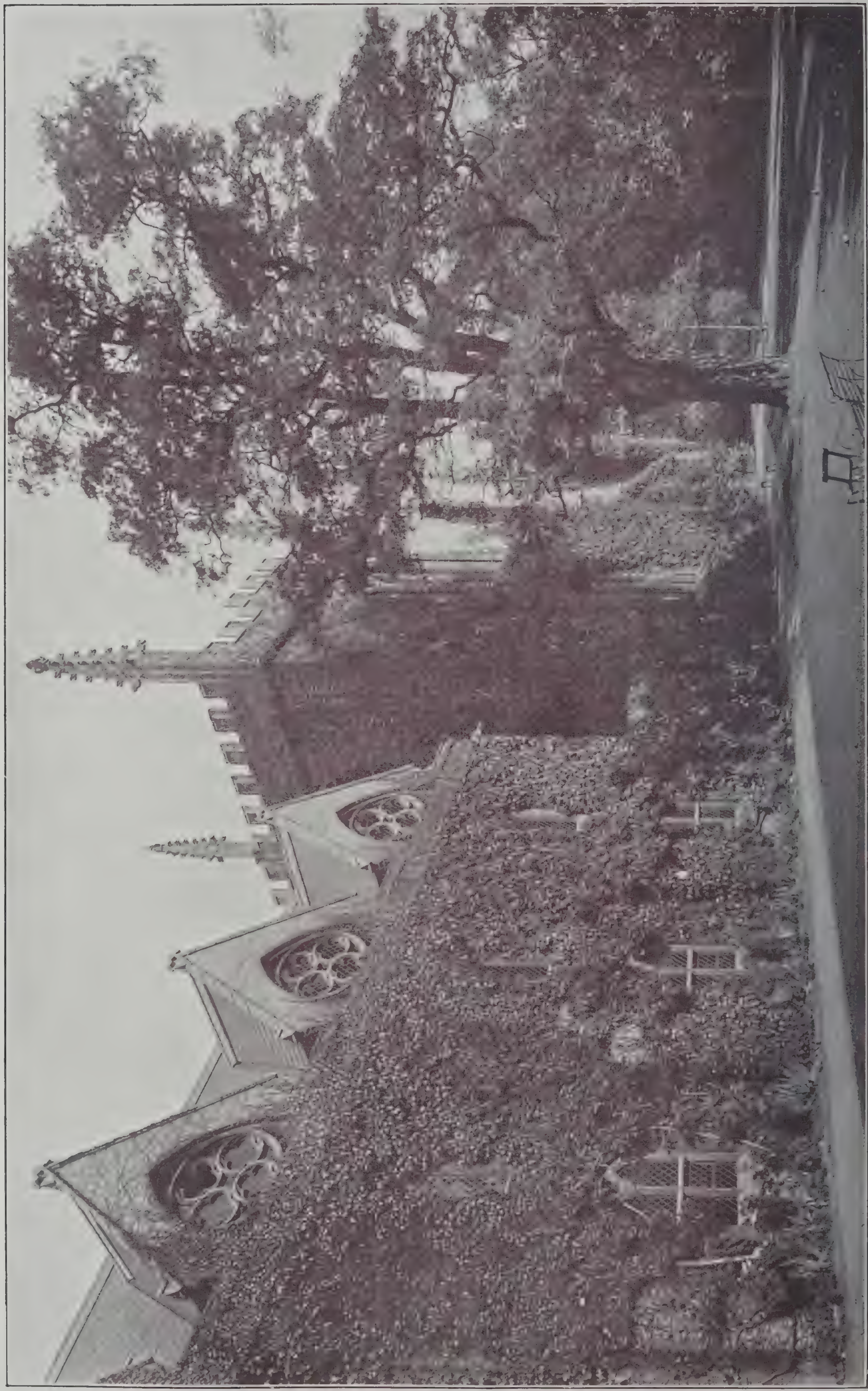

Oxford College Series. No. 65.—Exeter: Fellows' Lawn.

Photo by A. E. Walsham, 49 Doughty Street, W.C.

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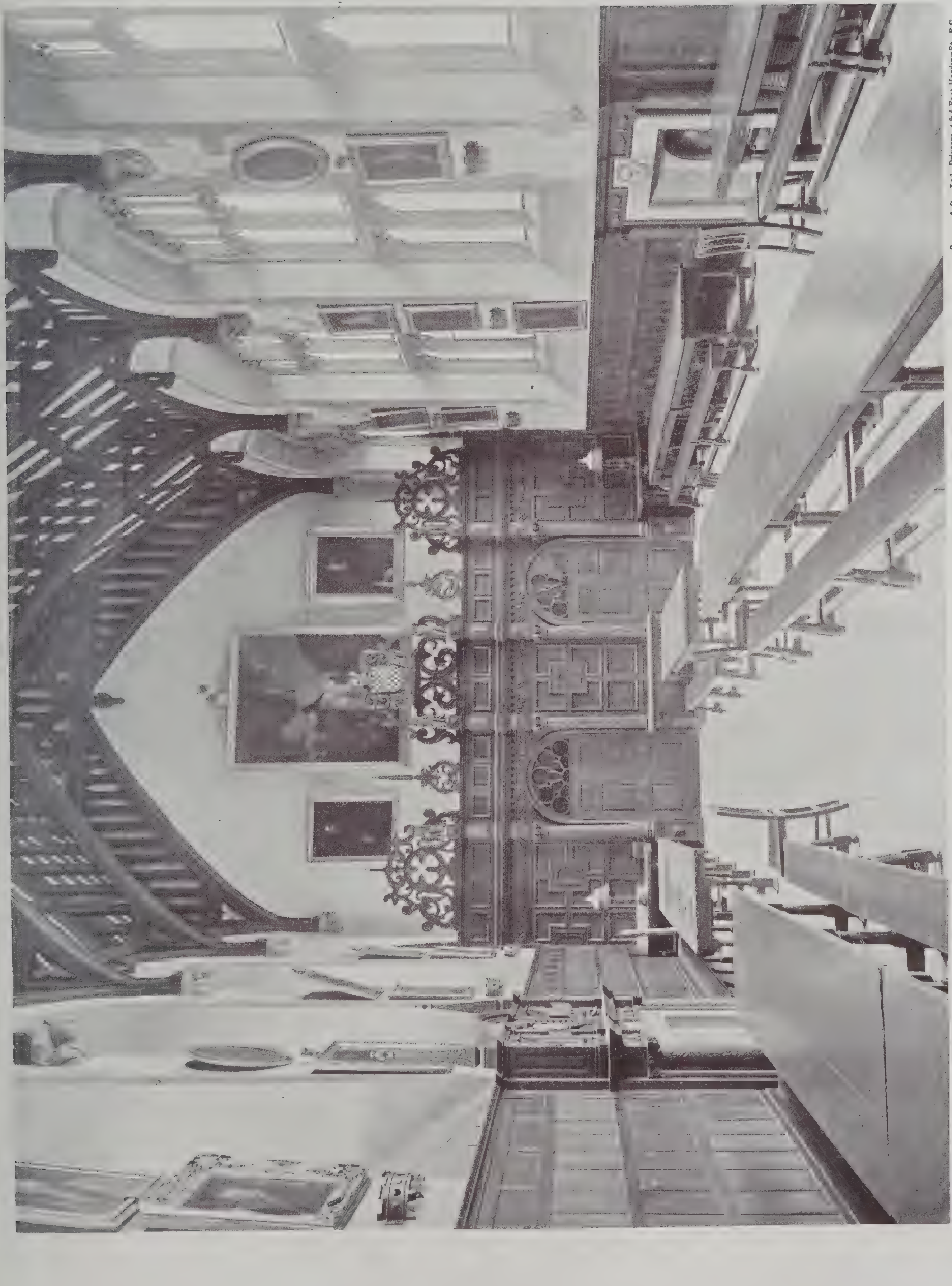

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OXFORD COLLEGE SERIES. No. 66.—EXETER: CARVED SCREEN IN HALL.

# The Architect.

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## FORTHCOMING EVENTS.

*Saturday, May* 14.

Institution of Municipal Engineers : Paper on "Prospects in Municipal Engineering," by Mr. E. A. Rogers.

*Saturday, May* 21.

Edinburgh Architectural Association : Visit to Broomhall, Fife.

*Monday, May* 23.

Royal Institute of British Architects : Paper on "The Art of the Monument," by Mr. E. A. Rickards, F.R.I.B.A.

*Thursday, May* 26.

Incorporated Society for Promoting the Building of Churches : Annual General Meeting.

Surveyors' Institution : Liverpool Meeting.

## KING EDWARD VII.

PEACE is of all things the most vital and important condition for the development and even existence of art, and of all arts architecture is more dependent than any other on peaceful times; hence the memory of EDWARD THE PEACEMAKER must ever be revered by artists generally, and by the followers of the art of architecture particularly, as that of the man who, despite the limitations of a British constitutional monarch, has done more to promote the cause of peace than any other individual of our time or of any time.

His late Most Gracious Majesty King EDWARD VII. was an artist. As an architect from the rude and raw material of clay in the pit, stone in the quarry, and timber in the tree, constructs an abiding and beautiful edifice, so did he from the unpromising material of racial differences, traditional mistrust and mutual jealousies build up a temple in Europe of goodwill, friendship and respect.

The secret of HIS MAJESTY'S success as an artist in peace-making was founded on the truth expressed in the words of MILLET, adopted by our Royal Academy as its motto for this year :—"Le fond de tout est toujours ceci : qu'il faut qu'un homme soit touché d'abord pour pouvoir toucher les autres." Full himself of good-fellowship, courtesy, kindliness, he modelled the hearts of nations to a similitude of the goodness of his own. As a sculptor sees within the shapeless block of marble the beautiful form that only needs the discriminating work of the chisel to reveal its charm, so did EDWARD THE PEACEMAKER discern within the mass of a continent in arms the potentiality of a brotherhood of peoples.

During the all too short reign of EDWARD VII. architecture has made visible advance in the extended manifestation of artistic power amongst the general body of those who are its practitioners in Great Britain. There is a higher general level of achievement, a wider spread of ability and knowledge.

His late MAJESTY was an earnest patron of architecture, as of every other art or activity in which his subjects engaged, and whilst he did not unduly exalt our art beyond its due share of Royal favour—for a just sense of proportion was one of the characteristic traits of HIS MAJESTY'S mind—he took a prominent part in at least two great national memorials, the ceremonial processional way in the Mall and the Victoria and Albert Museum, whilst the King's Sanatorium will stand as evidence of his interest not only in architecture, but in what was most dear to his heart, the cause of the hospitals.

The art of architecture has during King EDWARD'S reign received more frequent recognition than previously in the honours bestowed upon architects, and if we must credit the knighthoods of Sir HENRY TANNER and Sir CASPAR PURDON CLARKE as partly due to their official positions, we can fairly claim the titles of Sir ASTON WEBB, Sir WILLIAM EMERSON, Sir R. ROWAND ANDERSON, and Sir A. BRUMWELL THOMAS as rewards for their work as architects.

Architects, therefore, not only as Britons, but as artists, must feel as poignantly as any of their fellow-subjects the overwhelming loss of His Most Gracious Majesty King EDWARD VII.

an architectural and decorative arts exhibition, including executed works, students' designs, and an arts and crafts exhibits, or else have a similar exhibition in the R.I.B.A. galleries?

This is a point upon which we should like to have the opinion of our readers, as it is assuredly one which vitally affects the future of architecture in this country.

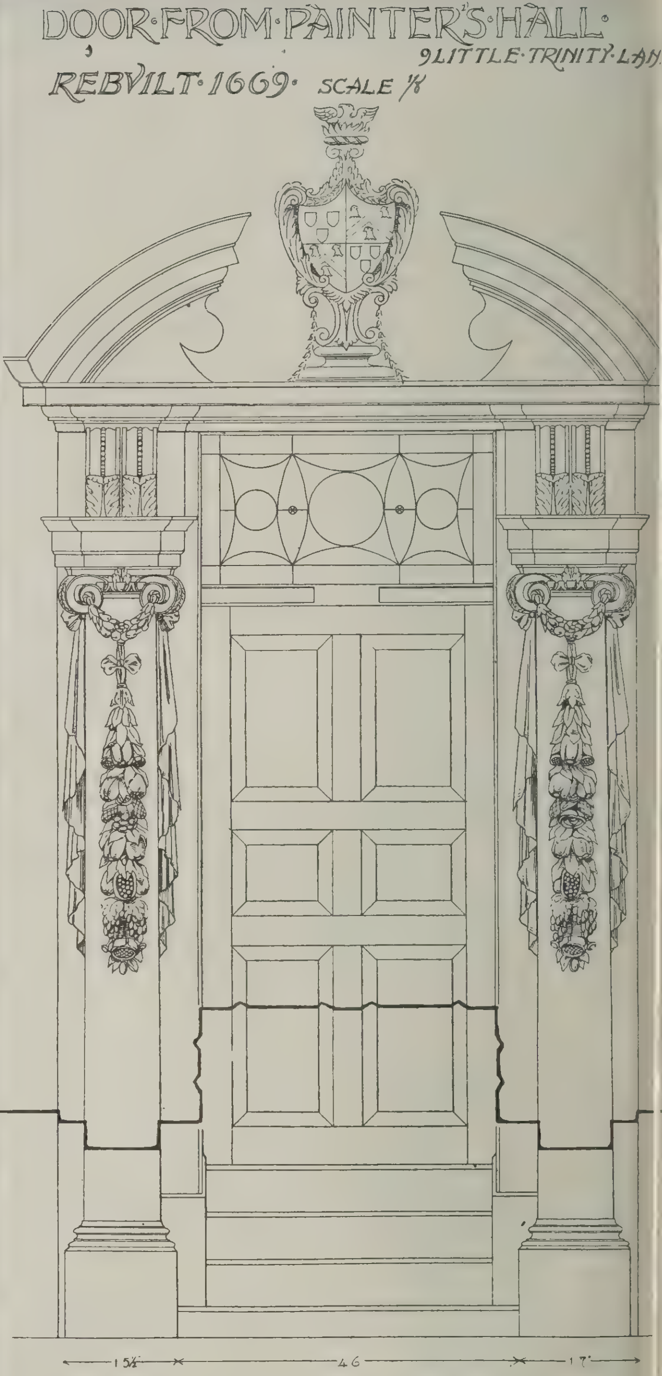
## ARCHITECTURE AT THE ROYAL ACADEMY.

It is remarkable that in this year's exhibition, though there are a goodly number of examples of domestic work, there are few if any houses of large size or of great importance, and in this we think that the exhibition is symptomatic of the position of present day architecture in respect of house building. It is doubtless good ground for satisfaction that the 1,000*l.*, or even the 500*l.*, house should be architecturally and artistically designed, as showing that the appreciation of beauty in the home is permeating a wider circle than in the days when anything above the mediocre or vulgar was only to be found in the house of the man who could afford 20,000*l.* for its erection, and who possibly did so not because he appreciated what he got, but because he thought it good form to own a place designed by Norman Shaw or Ernest George.

Now, instead of a few stars of the first magnitude we find our domestic architecture produced in excellent fashion by hundreds of artists of quite equal ability, even if favoured with less opportunity than the famous men of the latter half of the nineteenth century.

Mr. J. Francis Doyle, in his "Standon Hall, Staffs," has a respectable Tudor manor house, apparently L-shaped, but with no plan given. A stone building with windows large enough for modern ideas, and not free from other anachronisms. Mr. Herbert A. Welch shows "Two houses on the Hampstead garden suburb," a pleasant composition in brick with a small amount of diaper and tile roofs with the now fashionable shorn off verges that rather suggest a face without eyebrows. "No. 65 Harley Street," by Mr. Claude W. Ferrier, is a plain red-brick building with a stone ground floor storey and a circular portico with a stone pedimented window over as the central feature. Mr. R. Douglas Wells, in his "Timber House, Grand Falls, Newfoundland," has transplanted to the far off Dominion a Norman Shaw type of Surrey house. "Recess in Hall," by Mr. H. Davis Richter, is the modest title of a sumptuous fireplace and mantel in a recess between Corinthian columns and forming part of an elaborate and costly hall in a big mansion.

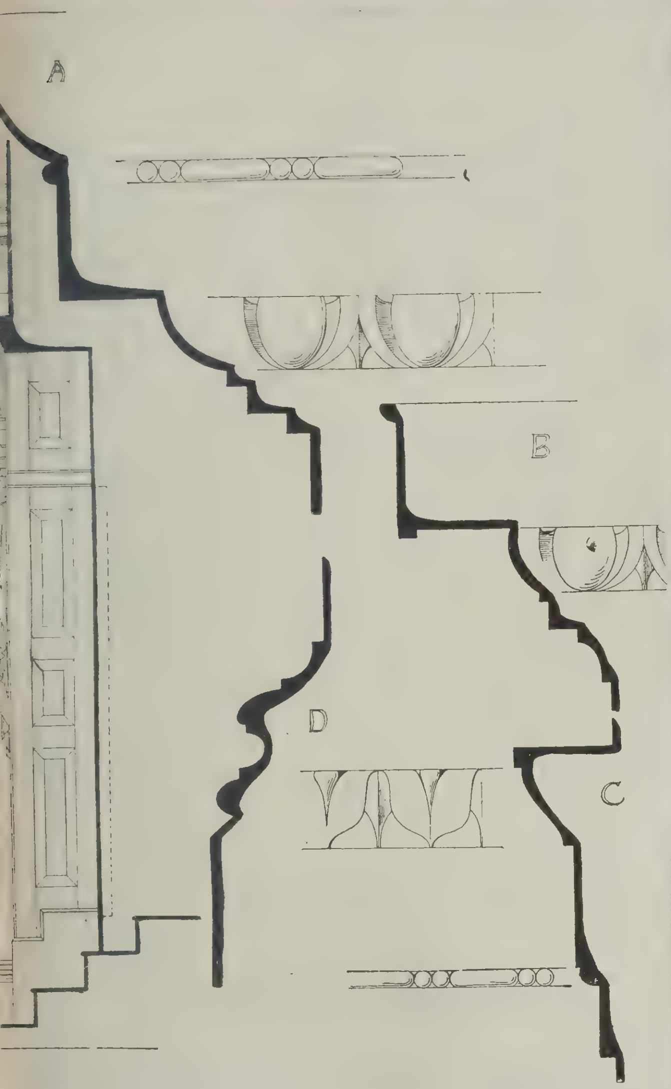
Mr. Ernest Newton's "House at Church Stretton, Salop," is a three-gabled front, E-shaped on plan, projecting bays under the two outer gables being hung with copper, presumably, from the green tint that they are already supposed by the artist to have assumed. "Marrowells, Walton-on-Thames," by Mr. A. Winter Rose, is a study of a lily pond in front of a house with big quoins, possibly of brick. Mr. J. Herbert Somerset's "Cornerlot, Hardelot, France," is a modest-sized house which some might call a bungalow for His Grace the Duke of Argyll; simple rough-cast in treatment, E-shaped plan, with two-hipped ends and a central gable over the entrance. "No. 4 Wimpole Street" is one of Mr. W. Henry White's usual type of houses in the doctors' quarter, a brick front with a stone bay and a stone ground floor doorway at the side of the bay. "Olantigh, Wye, Kent," by Messrs. A. Burnett Brown & Ernest R. Barrow, shows a traditional eighteenth century "pediment and portico" of two storeys in Lord Burlington's manner to a plain brick house with stone window dressings and quoins, a tile roof, and banded chimneys of stone and brick.



Measured and Drawn by Miss Victoria Williamson.

Mr. C. E. Bateman has thoroughly well caught the genius loci in "Aber Atro, Llanbear, Merioneth," a stone and stone-slated group of buildings, free from modernity of feeling. "Räthen, Hindhead," by Mr. Henry A. Saul, is a plastered house with stone quoins and window dressings, and tile roofs with red-brick chimneys. A refreshing variant on the usual E-shaped front is supplied by Mr. Lionel F. Crane's "Highfields, Marlow," in which circular porticos in either stone or wood between the projecting arms form pleasant verandahs. There is perhaps a little clash between the feeling of the half-timbered fronts with herring-bone filling and the Classic regularity of the colonnaded porticos. The entrance front is shown in another drawing of plain red brick with a porte cochère and square tower. "Bicton Hall, Devon," by Mr. Walter Tapper, is a big red-brick house with a stone ground storey and projecting stone loggia and portico.

Mr. Edwin L. Lutyens's single exhibit this year is "Great Maytham, Rolvenden, Kent," a plain red-brick house in a big expanse of formal but simply-treated garden. "The Common-room at Rounton Grange, Northallerton," by Mr. George Jack, has a barrel ceiling over panelled walls, and the windows are, somewhat peculiarly, high up above the panelling, in fact interpenetrating the ceiling.



DETAILS OF DOOR FROM PAINTERS' COMPANY'S HALL.]

Mr. E. Guy Dawber's "House at Deeside, Cheshire," has a plastered centre block with a curious Dutch-like gable and red-brick wings. Mr. Dawber's second exhibit, "House at Headley, Surrey," is a symmetrical brick house with bays apparently of wood on brick plinths. "The Croft, Woodchurch," by Messrs. John W. Fair & Val Myer, is a house built around an internal court, in which the authors have introduced a variety of treatment, as one looks through a stone arcade on to one side of the court with half timbering and plaster panels, and another adjoining in brick and tile hanging with a half-timbered bay. Mr. R. Stephen Ayling's "Proposed New Residential Club, Bolsover Street," is a quite utilitarian, almost barrack-like structure in purple brick with red dressings, a stone entrance and a Mansard slate roof.

Mr. Ernest Newton again illustrates "Ardenrun Place" with a general view of the entrance front and the accessories. "Stoatley Hall, Haslemere," by Messrs. Read & MacDonald, is a study of Jacobean Gothic in stone with red-tile roof and red-brick chimneys, and apparently, no plan being given, shows the hall. Mr. W. Courtenay le Maitre's "Interior of Entrance Hall, Horton Hall, Northampton," is a florid and rather overdone interior with marble floor and columns, costly and gorgeous but devoid of homeliness. "House at Northwood, Middlesex," by Mr. Thomas H. Rhodes, is as well as can be seen in its elevated position near the ceiling a pleasing composition of gables and chimneys over a brick ground storey and plastered first floor. Messrs. J. W. Simpson & M. Ayrton in two clever drawings show a "House at Hertford Heath," long and low with a flat pitched roof and plastered and stone walls.

## DOOR OF PAINTERS' COMPANY'S HALL.

THE Halls of the various City companies are famous in many instances for their art treasures, and that of the Painter Stainers' Company is no exception, for the entrance to the Hall (in Little Trinity Lane) is through one of the most beautiful of the carved doorways of the Renaissance period now left to us in London.

The Hall was rebuilt in 1669, and the carving is, therefore, contemporary with Gibbons, although the refined detail of the mouldings and the pendant masses of fruit and flowers are now sadly marred by numerous coats of paint. The whole conception contains many typical features of later Renaissance work, and is worthy the attention of those of our readers who may be studying that period.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

IT would seem that the members of our Sketching and Measuring Club have for the most part not as yet devoted much attention to the study of Renaissance, as the number of examples of eighteenth century work contributed falls considerably below that of the earlier periods.

Mr. Reginald Pywell has measured the so-called Temple of the Sun, Kew Gardens, designed by Sir William Chambers, and one of the most satisfactory in design of the many garden pavilions to be found at Kew. Mr. Pywell's work is carefully measured and fairly drawn, but would have been more complete with details of the rather interesting frieze decoration.

"Dubline" has also made a very careful study of one of Sir William Chambers's works, the Casino building at Marino, Clontarf, co. Dublin, Ireland. This is an excellent instance of Sir William's use of the Doric order, and has been very thoroughly measured and ably drawn by our contributor.

"Esek" sends drawings of the principal entrance doorway to No. 8 Park Square, Leeds, adorned with columns and entablature, carrying a circular pediment. The design shows distinct evidence of the influence of the Brothers Adam. "Esek's" drawing this time is not quite up to his usual standard.

"Sans Peur" shows us an interesting building in the Old Hall of the Shipwrights above the Sally-port tower, Newcastle-on-Tyne. The building has many good points in its design, besides much quaintness and a nice feeling in the mouldings. The author's work is well done both in measurement and drawing.

"G. H. F." has drawn part of the façade of a house formerly at Enfield, now in the Victoria and Albert Museum at South Kensington, an excellent typical example of eighteenth century English cut brickwork with good detail and carving, which is well expressed by "G. H. F." We may say that there is no objection to students selecting for study as part of the work of the Sketching and Measuring Club examples in museums. The fact that they are to be there found is presumptive evidence of their value for study.

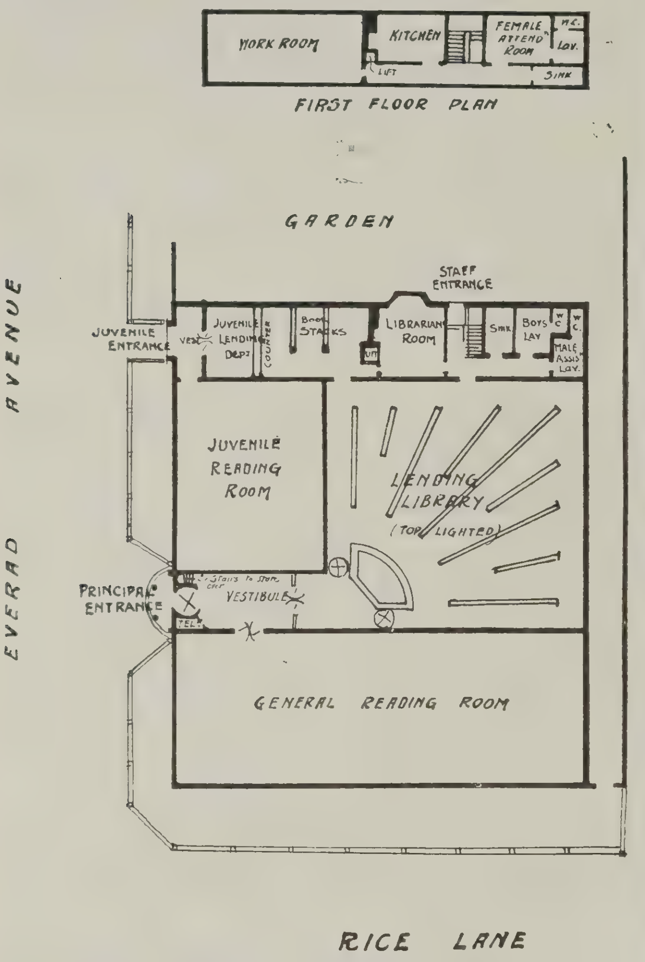
We have awarded the prize for April to "Dubline."

## COMPETITION FOR LIBRARY AT WALTON AND FAZAKERLEY, LIVERPOOL.

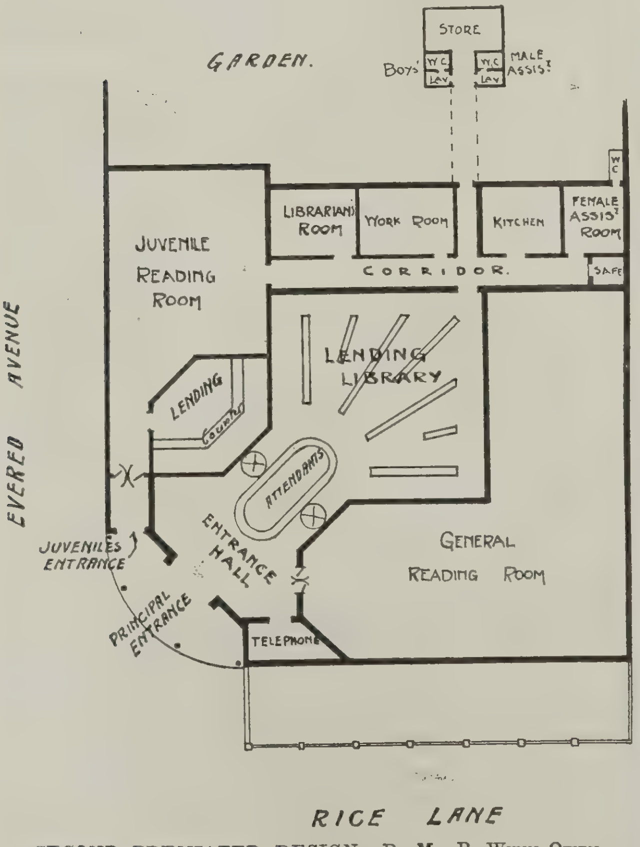
THE Library, Museum and Arts Committee recently invited architects practising in Liverpool to submit competitive designs for the above, and appointed Mr. W. E. Willink, F.R.I.B.A., assessor.

In response to the invitation twenty-five designs were submitted. The accommodation required is as follows:—

Open access lending library with accommodation for 20,000 volumes. General reading-room, about 76 feet by 28 feet, with open access shelving for volumes. Juvenile reading-room, with separate entrance, 50 feet by 28 feet, with lending library partitioned off. Librarian's-room, kitchen, female assistants' room, lavatories for boys, male and female assistants, and work-room, &c. In lieu of verbal description the three premiated designs are shown by the accompanying sketches of the plans. The principal road is Rice Lane.

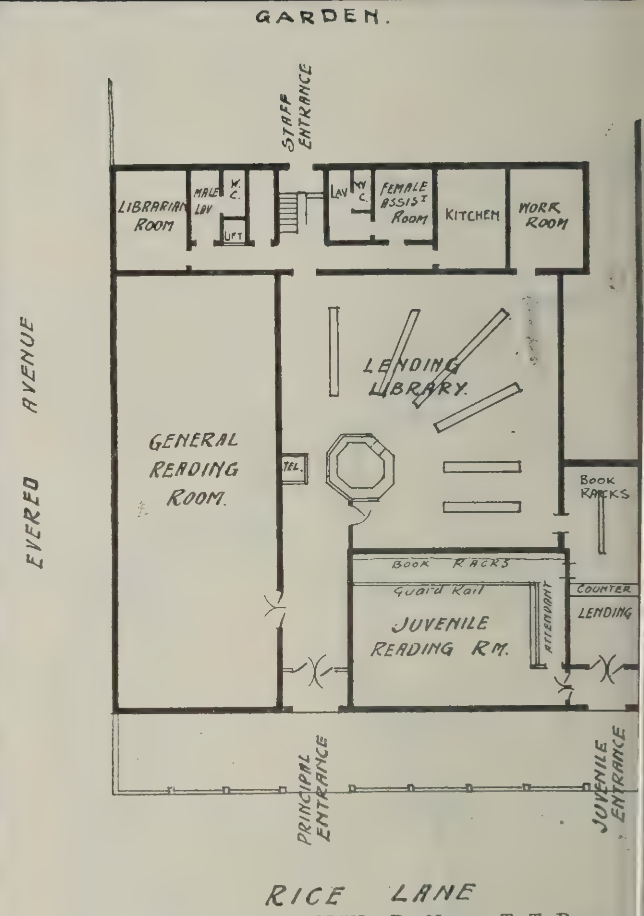


FIRST PREMIATED DESIGN.—By Messrs. BRIGGS, WOLSTENHOLME & THORNLEY.



SECOND PREMIATED DESIGN.—By Mr. R. WYNN OWEN.

The cost of the building, including furnishing, was not to exceed 7,000*l*.



THIRD PREMIATED DESIGN.—By Messrs. T. T. REES & F. B. HOBBS.

## THE ARCHITECTURAL ASSOCIATION ANNUAL DINNER.

THE annual dinner of the Association was held on Thur day evening, May 5, at the Trocadéro Restauran Piccadilly Circus, Mr. HENRY TANNER, F.R.I.B.A. (president), in the chair.

Among the numerous guests were:—Messrs. Ernes George, A.R.A., A. R. Stenning, H. Greville Montgomer John Murray, David Murray, A.R.A., B. Mackenna A.R.A., John W. Simpson, Walter Cave, A. Stone Gerald C. Horsley, A. G. Temple, Paul Montford, R.B.A G. E. Bond, J. Williams, F. H. Atkinson, Baxter Greig, W Paul, Percy May, A. J. Perrin, F. R. Yerbury, A. Spencer, A. C. Dickie, J. H. Squire, C. G. Boutcher, Horsley, F. Winton Newman, C. Wontner Smith, W. Scott-Moncrieff, P. L. Forbes, W. G. B. Lewis, Stanle Towse, F. R. Betenson, C. Tanner, G. E. Hutchinso Stanley Hamp, F. R. Farrow, H. V. Ashley, H. A. Hal R. Dircks, Edwin Gunn, S. A. Green, C. Anderson, A. Nightingale, William Johnson, A. E. Maxwell, Alan Potte H. B. Elkington, D. J. Campkin, H. C. Corlette, S. Warwic A. N. Prentice, Maurice B. Adams, Arthur Keen, E. Tanner, L. Mumford, J. Dudley Forsyth, A. Lowry, H. Samson, H. B. Symons Jeune, L. M. Yetts, G. Filde G. Leonard Elkington, Allen Foxley, G. Northover, Ell Marsland, Max Clarke, W. Dewes, J. F. Bull, F. W. Mark A. Dixon, H. G. Tayler, J. Pirie, Alec Smithers, S. M. Spoo Gervase Bailey, F. W. Pomeroy, A.R.A., F. Dare Clapha C. McArthur Butler, R. B. Pilcher, A. O. Collard, S. Arding, E. Carless, G. Hubbard, A. W. Moore, W. Tapper, H. P. G. Maule, Theodore Fyfe, J. B. Scott, A. Bentham, Lorne Wallet, W. H. Ward, Horace Field, Aubr Jamieson, G. M. Nicholson, F. J. Saffery, H. E. Moore, J. Cheston, C. C. Sealy, M. Day, W. G. Newton, P. E. Web Prof. E. C. Alston, P. W. Lovell, Maurice E. Webb, I MacAlister, W. H. Jamieson, Maxwell Ayrton, Herbe Batsford, J. Starkie Gardner, H. J. Leaning, A. E. Vey, Vey, H. G. Satchell, E. J. T. Lutyens, S. A. Stang R. Frank Atkinson, G. Corderoy, and D. G. Driver (sec tary).

After the loyal toasts had been honoured,

Mr. JOHN W. SIMPSON proposed "The Architectu Association." They all knew, he said, the glorious past the Association, and they were assured of its still m glorious future. He would not, however, inflict upon them statistical or retrospective review of their affairs—he was never enamoured of figures, and after dinner he thought them abhorrent. He wished to say a word for the Philistine, since he believed they were all getting too "arty," he did not use the word "artistic." The official paper of the Association was decorated with a dainty device showing two strong men, in what were technically called "shorts," he assumed them to be Mr. Tanner and Mr. Alan Potter. Beside them were the inspiring if somewhat irrelevant words "Design with beauty—build in truth," a motto which they would observe very neatly indicated the two great processes of all creative art, the conception (design) and the execution (building), their ultimate purpose being even more happily crystallised in the device of the Royal Institute *Usui civium decori urbium.* So they enunciated their creed that the architect must have a double qualification and architecture a twin purpose. It followed then that the designer who failed on the executive side was an incomplete artist, just as the executant was an incomplete artist if he were weak in design. He would relate to them a fable, it was not to be found in the "Arabian Nights Entertainments," "The History of the Two Butchers and the Naked Truth." Once upon a time there were two butchers, and the first butcher, who was a common man chose Smith, who was a Licentiate to build his shop; and artists said "What rotten detail!" But the sirloins and the saddles looked tempting and the common butcher sold tons of meat, and said "Smith is a good architect." As the Council turned down Smith for the Fellowship he called himself registered architect, or, for short "R.A." The second butcher, who was a man of taste, had his shop designed by Kensington Percy, who made him a study in white of 1750 with swags, and the butcher said, for he had read it in books, "Art should colour our daily life," and he despised his neighbours, for the drawing was in the Academy. When the bailiffs took possession, he reproached the architect because he had persuaded him to be Georgian, though his commerce was with contemporaries. "You are quite wrong, I assure you," said Percy, "meat should always be seen behind small sash-panes, they give it such character." "Though I respect art," replied the second butcher, "I have no use at all for a fool!" and he beat in the architect's head with his cleaver. And the moral, which was the only place where anything was said about the naked truth, was "St. Paul's is a good cathedral but a bad master." The plain truth was then that our first duty was not to work out our own artistic salvation and to erect perennial monuments to ourselves, but to give our clients what they wanted, so that they might pay us cheerfully and enable us to keep a home and defy the Budget. But it was equally true that we had another duty. We might not rest content only to solve the problems given us in the easiest way; we were professors of the beautiful, and though we might not ignore or even vary the conditions given us, we must clothe our solution with beauty or forfeit our claims to be artistic, and it was to this end that the Architectural Association existed.

The President in his response said he heartily endorsed Mr. Simpson's remarks about the two butchers, for he had tried by the fable to teach them their duty towards their neighbour. Surely their first duty was to give clients what they wanted. If they failed in that, though they might clothe their work artistically and get a passable result, they had not fulfilled the first duties of an architect. Even more than that, they were bound in their client's interests to take advantage of every modern system of construction, or any improvement, and be up to date. They had a double duty laid upon them, they had to be artists and scientists as well. It was possible to be both, and in the training of students at their school (which he believed to be among the best in the kingdom), Mr. Maule, the headmaster, endeavoured to bring out that dual capacity. Some people, he said, had accused him of undue pessimism when he referred to the affairs of the Association in his Presidential address, but he had no feelings of pessimism, all he wished to do was to call attention to what he considered were its weak points. He knew his men, and it sufficed to merely suggest innovations towards improvement, and they loyally supported him. In his concluding words the President said he wished to thank the Council and Mr. Clapham (vice-president), who had been more than a right hand man, and Mr. Arthur Keen. A more hardworking and more conscientious member of Council than Mr. Keen could not be found, and it augured well for the Association to have him as its new president. His thanks were also due to Mr. Elkington. He would leave the presidential chair, he said, with regret not unmixed with relief in the freedom from responsibility, but he would never forget his year of office at the Association, and the many good friends he found there.

"The Royal Institute of British Architects" was proposed by Mr. Arthur Keen. The Association, he said, appreciated the kindness and support which the Institute extended to them. They had undertaken great responsibilities of late years, and the help of the Institute became increasingly valuable and necessary. To an extent the help was reciprocal, for while the Institute gave them its support, it looked to them for a constant supply of new members, and nowadays it required a very high standard of proficiency and knowledge such as they gave to their students at Tufton Street. They showed their loyalty to the Institute by adhering closely to the syllabus drawn up by the Board of Architectural Education and issued by the Institute for the guidance of educational bodies, and if that syllabus should at any time be withdrawn, he had very little doubt that the Association would deal with the new conditions, whatever they might be. Those two bodies had existed side by side more than sixty years, he believed, and harmonious working was natural and almost spontaneous when the members of one were members generally of both bodies. Co-operation was therefore right and proper. A phase most worthy of remark in connection with the Institute was the great change which had come over it in recent years, and from being distinctively a professional body it had become now an artistic body. It was well known that there was a time when a large section of the architectural profession held itself aloof from the Institute on the ground that it represented the professional and business side of architecture rather than the artistic, but that attitude was now a phase of the past, and the speaker thought the Institute might today very fairly claim to represent the best interests of architecture as a great and leading art; at any rate, that was the aspect in which the Institute appealed to them as an educational and professional body.

Mr. Ernest George, A.R.A., in responding to the toast, said the Institute had always shown the kindest feeling towards the Association, a body full of vigour and the best elements of their profession. The Institute was at one time regarded as a set of old fogeys, but he thought the minority of its members now only had that distinction. The governing body tried to move with the times and represent the wishes of the greater number of architects. Under their new powers they had, he supposed, the guidance of architectural education, a matter in which they took the keenest interest. The education of the future architect was the question they all ought to have most at heart. He claimed as friends various students of the Association's school, and he was delighted to find so much earnestness among them. It must be gratifying to the members of the Association to know that one of their past presidents, Mr. Leonard Stokes, was to succeed him when he retired from the chair at the Institute.

Mr. Maurice Webb gladly surprised the company, submitting a bumper toast to their President, leading the refrain "For he's a jolly good fellow."

Mr. Tanner briefly replied.

Mr. Walter Cave proposed "The Guests," Mr. David Murray, A.R.A., and Mr. Scott-Moncrieff responded.

Musical items arranged by Mr. Lorne Wallet were rendered between the speeches.

## THE NATIONAL GALLERY IN 1909.

THE report of the Director of the National Gallery for the year 1909 has recently been issued. In the course of it reference is made to the extension of the Gallery.

The construction of five new rooms on the site of St. George's Barracks, at the back of the rooms devoted to the British School, has made good progress, and it is hoped that they will be completed by the autumn of 1910. The site will leave room for a further extension of two large rooms and for a small extension of the National Portrait Gallery. Plans showing this allotment of space were submitted to the Trustees by H.M. Office of Works and were approved by the Board.

A special Committee under the chairmanship of Earl Plymouth, assisted by Mr. John Belcher, R.A., and the Hon. Sir Schomberg McDonnell, K.C.B., with Mr. Ernest Bright as Secretary, was appointed to inquire into the state of the building with regard to fire risks. After an exhaustive inquiry the Committee reported that certain alterations for the protection against fire were necessary. These alterations involved the reconstruction of the roofs and floors of part of the older portion of the edifice, and they are now being carried out. Five rooms, Nos. 12, 13, 14, 16, and 17, and the offices below them are closed for this purpose. The pictures they contained have been temporarily placed on screens and on the walls of other rooms, as far as possible; but many large pictures have for a time been withdrawn from exhibition. It is hoped that the reconstruction and fire-proofing of this section will be completed by the autumn of 1910, and the pictures replaced upon the walls.

The most important event of the year has been the acquisition by the Gallery of the portrait of Christina of Denmark, Duchess of Milan, by Hans Holbein the younger. This work was purchased and presented to the Nation by the National Art Collections Fund with the aid of a grant from H.M. Treasury of 10,000*l.*, and the gift of a sum of 40,000*l.* from an anonymous donor who supplied a large deficit in the purchase money at the last moment. This masterpiece had been on loan at the National Gallery for a period of twenty-nine years by the generosity of its former owner, the Duke of Norfolk. It was painted by the master from a sketch made at Brussels on March 12, 1538, for Henry VIII. It has an unbroken history from the time of its ownership by Henry VIII., through the Lumley, Pembroke and Arundel collections, into that of the Duke of Norfolk. His Grace, the present duke, generously lent the picture to the National Gallery for a period of twenty-nine years. The picture is on oak, 5 feet 10 inches high by 2 feet 8 inches wide, and is in room 15, No. 2,475.

The difficulty of raising a large sum of money at short notice for the purchase of masterpieces that ought to come to the National Gallery when offered for sale, or when a large offer is made for them from abroad, is very great. His Majesty the King graciously made, through the National Art Collections Fund, the suggestion that a reserve fund should be formed by subscription for this purpose. It is hoped "that the example set by His Majesty and their Royal Highnesses the Prince and Princess of Wales as first subscribers to this fund may be largely followed, and result in a substantial provision against sudden calls."

The two other works purchased during the year were *April Love*, by Mr. Arthur Hughes, and *Scene from the Beggar's Opera*, by William Hogarth. *April Love* (Room 3) was painted in 1856 and exhibited at the Royal Academy. Mr. Hughes sold it to William Morris. It was purchased by the Trustees for 350*l.*

Ruskin, in his "Academy Notes" for 1856, wrote:—"Exquisite in every way, lovely in colour, most subtle in the quivering expression of the lips and the sweetness of the tender face, shaken like a leaf by winds upon its dew, and hesitating back into peace."

The example of Hogarth's work was purchased from Mr. John Murray, the publisher, for 1,750*l.* It stands in Room 19.

*A Favourite Custom*, by Sir Lawrence Alma-Tadema, O.M., R.A., was purchased under the Chantrey Bequest.

Sir Hubert von Herkomer, C.V.O., R.A., presented his *Council of the Royal Academy*, 1907.

Mr. A. J. Finberg has completed his chronological inventory of the drawings in the Turner Bequest with extraordinary care and skill, and the result of his labours has been published by order of the Trustees in two volumes of 1,300 pages, at the price of 15*s.* This catalogue will facilitate the future exhibition of these drawings to the public when that is possible, with due regard to their preservation, and is the first complete inventory of this portion of the Turner Bequest.

The new Turner Gallery at Millbank, the gift of the late Sir Joseph Duveen, is nearing completion, and the Turner Bequest will be properly seen in the ten exhibition galleries so provided. A certain number of the master's works will be retained at Trafalgar Square so that he may be duly represented in the Gallery of European Art. The building of the new wing has made it necessary to alter the accommodation for refreshments. A new refreshment-room and a larger kitchen have accordingly been provided in the basement underneath rooms 1 and 2.

The Gallery in Trafalgar Square was visited by 607,952 persons on the free days during the year, showing a daily average attendance on such days (206 in number) of 2,951. In addition to the above number, 67,452 persons visited the Gallery on Sunday afternoons throughout the whole year, showing a daily average attendance of 1,297.

On students' days (Thursdays and Fridays) 63,391 persons were admitted between January 1 and December 31, 1909; the admission fees (at 6*d.* each) amounting to 1,584*l.* 15*s.* 6*d.*, as compared with 1,592*l.* 5*s.* 6*d.* received in 1908.

The National Gallery, British Art, at Millbank, has been visited by 249,110 persons on the free days during the year, showing a daily average attendance on such days (206 in number) of 1,209. In addition to the above number, 56,986 persons visited the Gallery on Sunday afternoons throughout the whole year, showing a daily average attendance of 1,096.

On students' days (Tuesdays and Wednesdays) 36,463 persons were admitted between January 1 and December 31, 1909; the admission fees (at 6*d.* each) amounting to 911*l.* 11*s.* 6*d.*, as compared with 1,003*l.* 1*s.* 6*d.* received in 1908.

The amount annually realised by admission fees at both establishments is devoted as an "Appropriation in Aid" of the Parliamentary Vote to the National Gallery.

The total number of students' attendances for copying pictures at the Gallery in Trafalgar Square on Thursdays and Fridays throughout the year was 17,345. Independently of partial studies, 661 oil-colour copies of pictures have been made, viz., 333 from the works of 91 old masters and 328 from the works of 24 modern painters.

Two hundred new students have been entered on the books during the year.

The total number of students' attendances at the Gallery of British Art on Tuesdays and Wednesdays throughout the year was 6,139; and 306 completed copies of the pictures have been made in oil-colours, 95 in water-colours, and 23 in pastel.

## ILLUSTRATIONS.

### ST. PHILIP'S PARISH INSTITUTE, CAMBERWELL.

THIS is a Church Room and Institute proposed to be built in the place of an existing small room standing on the same site and close to the church and parsonage house. Both the church and the present room are of Kentish ragstone, and as this small room will be demolished it is proposed to re-use the material from its structure in the base of the new building.

The Institute comprises a hall with an end gallery to accommodate 400, with class-rooms, kitchen, and the usual accessories to meet the needs of various parochia organisations, including Sunday schools, and the estimated cost is about 2,500*l.*

The architect is Mr. H. P. Burke Downing F.R.I.B.A., and his original drawing is now exhibited a the Royal Academy.

### COMPETITION DESIGN FOR NEW CLUB, SHANGHAI.

THE design which we publish to-day was sent in i competition for the above. It contained all the usua accommodation for a first-class residential club. Th frontage shown in the perspective is to the "Bund overlooking the river, a frontage similar to the Thame Embankment. The climate is in many respects simila to the English climate, so that broad, open verandah generally associated with architecture in the East wer not suitable here. The front was to be faced with re brick and local granite, a granite similar to grey Aberdeen and the roof covered with local black tiles.

The cost was not to exceed 200,000 taels. Ther being no drainage system in this part of the town, th soil pipes arranged on the latest English principle di charged into iron "boilers" of sufficient capacity for three-days' accumulation, which was then to be run o into night-soil carts and deposited on the surroundin country. The designs were by Messrs. Lovegrove Papworth.

### HOUSE AT WIMBLEDON.

THIS house has been built for Colonel Seton-Churchi in Clifton Road, adjoining Wimbledon Commo The walls are rough-casted externally, with a plinth red facings 3 feet 6 inches high, and the roofs are co ered with mixed tiles which have the very pleasing effe of old ones. The windows are glazed with stout diamo leaded plate glass. The work has been carried out Messrs. J. Burges & Sons, of Wycliffe Road, Wimbl don, from the designs and under the superintendence Messrs. Thomson & Pomeroy, F.R.I.B.A.

### OXFORD COLLEGE SERIES, EXETER.—HALL—FIREPLACE IN HALL

FURTHER illustrations of Exeter College are giv this week, showing some of the interior treatme and detail in continuation of our series of views of th college. Our readers will remember that a historic account of Exeter was included in our issue of April

## THE ARCHITECTURE OF BATH.

*(Continued from last week.)*

THE last house of Gay Street, which faces diagonally across Queen Square, forms part of the Queen Square scheme of building, and was in later years the residence of the younger Wood. The circular bay window has very fine detail at the first floor, where the coupled Ionic columns in the Venetian window are divided by blocks, and the arch in the centre is similarly treated. The unique plan of the interior shows the principal rooms formed of a rectangle with an apse at each end, and with this the rest of the house has to conform. On the ground floor the angles of the apses are marked by Ionic pilasters, and on the first floor by three-quarter Corinthian columns. The interior is panelled in wood, and the carving is very freely done. The embossed brass finger-plates are of the same date as the house.

The staircase is of oak and Spanish mahogany, and the quarter spaces are inlaid.

Eagle House, Batheaston, though reputed to have been the work of the elder Wood, was certainly not built by him, and it has been altered at least twice since its erection. In a recess upon the side facing the road the date, 1729, is cut upon a shield under the eagle, and it was about this time that Wood is said to have gone there. Perhaps he added this excellent porch, but even here the moulding round the door is quite unlike his usual work, though a common one in the neighbourhood. At any rate, the columns and entablature have been applied to the wall, and do not form part of its original construction. The younger Wood died here in 1781.

One of Wood's best works in the neighbourhood of Bath is Belcombe Brook, Bradford-on-Avon. It was merely an addition made in 1734 to the older clothworks of Francis Yerbury, and was intended as a residence for the owner. At this time there was a very flourishing cloth trade in Bradford-on-Avon. The buildings on the right are a dovecote and stabling, and the forecourt which lies between them and the house is paved with local Bradford stone set on edge, the centre being in circular courses. Upon the dial of the clock in the gable end of the stables is the date, 1770, and the initials J. Y. (one of the Yerburys). The house contains a hall, a drawing-room 20 feet square, and an octangular study with a coved ceiling and fine enrichments in plasterwork. The grounds of this house were laid out without formality, but a stone balustrade runs diagonally from the two angles of the house to the lawn. The little domed building of stone was erected by a working mason whom Wood praises for his ability. Close to the river bank is an octagonal structure about the same size, which was used by the owner for mixing his dyes in.

In 1735 Wood made a survey of the city, which was published by J. Leake in the following year. This map shows the connection of the new buildings on the north with the city by way of Trim Bridge and John Street, leading into Wood Street and Queen Square, the latter being also connected with the main London road by means of Quiet Street, which thus joins up Wood Street and Green Street. Thus far Wood's scheme was intended to be not only complete in itself, but to have proper and definite connections with the older work.

Beyond the west gate another scheme of building was in progress, planned by John Strahan, who was the builder of Redland Court in 1730 and Redland Chapel in 1740-43, both in Bristol. It is to be regretted that perhaps through jealousy Strahan comes in for some disparagement from Wood. Strahan's work is chiefly found in Kingsmead Square, Avon Street, Kingsmead Street, and Beaufort Buildings, the best fronts being those on the south side of Kingsmead Square. All this work was going on from 1727-36. Rosewell, or Londonderry House, built for T. Rosewell, whose rebus, a rose and a well, is under the circular pediment with the date 1736, is reputed to be by Strahan, but it is not at all in his manner. Internally it has a wide, handsome staircase, and the rooms were mostly panelled. Not the least interesting of the houses in this neighbourhood is Keene's *Bath Journal* Office, where a newspaper was established in 1742 which flourishes at the present day. Both inside and out this house has suffered scarcely any alteration since the day it was built.

In Avon Street and Beaufort Buildings, Strahan adopted a more definitely Classic manner with a Doric entablature, though the houses are quite small two-storey buildings.

Wood's chief work was Prior Park. Ralph Allen, whose country seat this was to be, desired to advertise his stone, and nobly he did it. The scheme, as first designed, placed the house in the centre with a pavilion and groups of offices at intervals on either side, all united by a colonnade. The outbuildings were to have been set at a wide angle with the mansion itself, but in the execution they formed two curved wings. The pavilion on the west gave way in 1844 to a Roman Catholic Chapel (by J. Scoles), and the best part of the stables now remaining is that which is vaulted in stone with small saucer domes. The stables were very large and sumptuous and had a frontage of 170 feet, with stabling for twenty-four horses. The south front of the mansion, which faces up the hill towards Combe Down, is much more simply treated than the other side, which is the principal front. But the work was conceived on a fine scale suitable to the surroundings, and the house measured 147 feet long by 55 feet wide. It was built in 1737. The long façade is relieved by an attached portico of six Ionic columns, and all the openings, ranging to fifteen in number, are kept quite plain.

The north front looking towards the city has dressings round the window openings and a projecting Corinthian portico. The portico has six columns on the front with one full column and one three-quarter column on the return. These are 3 feet in diameter and 32 feet high, and the stone is in wonderful preservation, with a beautiful colouring from the growth of lichens upon it. Wood had intended to have flights of steps on each side, but they seem never to have been carried out. The basement of the house is all vaulted and paved in stone.

The sweeping flights of steps which lead down to the lower ground were the work of Henry E. Goodridge, M.R.I.B.A., for Bishop Baines, and were executed about 1830-6.

I do not propose to show you any views of the interior as it at present exists, because there were many alterations after the fire of 1836, but I give here the plans from Wood's original drawings on the left and the same, roughly, at the present time on the right. The draughtsmanship is very fine, and it seems incredible to us how such drawings could be made with the naked eye. They are finished with a simple monochrome wash, and the ceilings and vaulting are dotted in with fine lines. The balustrades between the columns in the portico were omitted for access to the garden steps. The large hall did not run up through the floor as at present, and at the first storey there was a long gallery leading from Allen's business room to the private pew in the gallery of the chapel.

The sections are also from Wood's original drawings. All the walls were originally finished in stone, including the ornamental parts, though some of these latter were afterwards cut off and the walls of the rooms lined with wood.

At the foot of the slope below the mansion lies the Palladian bridge; it is almost a copy of the one built by Robert Morris at Wilton House in 1736. The architect is not known, since at the time it was built (in 1756) Wood was no longer in Allen's employ. The balusters are of a type scarcely known in Bath. Allen died in 1764, aged seventy-one years, and was buried in Claverton Churchyard.

Up to the year 1714 there was a law entitling the poor of England to travel to Bath and use the baths there. This law then ceased, but as the poor continued to come a scheme was started to find accommodation for them. In 1723 a subscription list was opened, and amongst those who worked hard for the proposed scheme was Richard Nash. Wood was employed to draft plans, and at first a site in the Ambry was proposed for a building to hold sixty beds. This all fell through, however, and it was not till 1737 that definite drawings were made by Wood for a site at the north-east corner of Parsonage Lane. The front extended 99 feet along the borough walls. In the old days, before Union Street was made, the east side faced the stableyard of the Bear Inn, and this was the only thoroughfare between the borough walls and Westgate Street, and was ordinarily used by visitors to and from Queen Square and the baths. The hospital was built to take 108 beds, exclusive of those for the nurses. The building was opened in 1742, and in the following year it was resolved that the inhabitants of Bath should be excluded from admission, but this was rescinded in 1835. Nearly the whole of the cost of management from the commencement to the completion was defrayed gratuitously. Subscriptions amounted to over 8,000*l*., in addition to there being considerable gifts in kind. Ralph Allen gave all the wrought freestone, paving stones, wall stones, and lime, in addition to large sums of money, and Wood gave his plans and supervision free. In 1795 John Palmer added two wards over the north front.

When the thoroughfare on the south side of Queen Square, which had been planned by Wood as 93 feet wide, was reduced to its present width, and the idea of making it into a Grand Parade was abandoned, Wood found a site just outside the city boundary on the south-east that would answer his purpose. He therefore, in 1740, commenced building. Near here on the east of Terrace Walk were Harrison's Rooms, and on the west Lindsay's Assembly Rooms. The Grand Parade is now the North Parade, and the Royal Forum became the South Parade. This thoroughfare is now 70 feet wide. The land originally lay at a low level and was the site of the Abbey orchard, and so, leaving the triangular piece of ground between Harrison's walks and the river at the old level, he raised the houses to approximately the same height as those on the Terrace Walk, and planned out the piece of waste ground into public gardens called St. James's Triangle, and approached from the Parade by a stone staircase. The retaining wall of the Grand Parade was finished at the top with a stone balustrade, as shown in the aquatint by Malton and Gandon in 1779. The length of the walk was over 500 feet by 42 feet broad. The blocks of houses, as usual with Wood, were placed north and south, and on the extreme east the basement of the houses had an exit on to a lower walk and the riverside. The first stone of this building scheme was laid on March 10, 1740, and the whole of the works were completed in about eight years' time. The central block of twenty-seven houses, which formed a square of 210 feet each way, were originally to have been treated with columns and pilasters, but this was afterwards abandoned. An engraving from an old fan shows the treatment of the South Parade as it was completed, and in this may also be seen the balustrading round the areas of the houses. This part of Bath soon became fashionable, and, amongst others, Edmund Burke, Oliver Goldsmith, William Wilberforce, and Miss Linley resided or stayed here. There are two houses on the Terrace Walk which still retain much of their old character, both of which seem to have been designed for shops or the like purpose. No. 1, Terrace Walk, has three large openings separated by Ionic columns with ornamental spandril pieces, all executed in stone. Almost adjoining this is an Ionic doorway with the original glazing, and this is believed to have been one of the coffee-houses where the upper classes were wont to assemble to read the papers and to discuss the news.

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* A paper read before the Architectural Association on April 29 by Mr. Mowbray A. Green, A.R.I.B.A.

Close to these buildings is a fine court of houses known as North Parade Buildings. Although they adjoin the North Parade they are probably not Wood's work. Nearly all the doorways have Corinthian porticoes, and the houses are well finished internally. The top house on the right was once the residence of John Palmer, Controller of the General Post Office and the introducer of the mail-coach system. But these days are passed, and the buildings are now for the most part let out as tenement houses. The last house on the west side has a wide hall vaulted in plaster, a very ample staircase, and many good rooms.

At Bathford in 1748 a house was built by Wood for a Mr. Southwell Pigott, and was called Titan Barrow Loggia. The north front, which stands on the top of a considerable slope, has been treated without a sufficient basement storey, so that it loses considerably in dignity. An interesting comparison may be made between this and the house at Belcombe Brook, the façade of which is treated with flat Ionic pilasters, and which is quite satisfactory in its proportions. There can be no doubt that when columns or three-quarter columns are used, especially if it be with the Corinthian order, they should stand on a storey or sub-base of some height. The front of Titan Barrow was very ornate, and the mouldings were enriched. Unfortunately, the ground-floor windows have been cut down. The elevation and plan are copied from Wood's drawings, and exhibit, together with the contract, the conditions under which the employer, architect, and contractor worked in those days. As usual, there is no scale on the elevation or on the plan, but the dimensions are figured and the specification is written within the walls of each room, the contract containing what else was necessary as to supply of plant, &c., to insure the carrying out of the work. The ground-floor plan has the signature of the employer, Southwell Pigott, together with those of John Ford (the mason), George Hatherell (the carpenter), and Robert Parsons (the carver), the contract alone mentioning the name of John Wood as the architect. The contract states that Ford contracted to dig the foundations, and to do all the mason's, plumber's, tiler's, plasterer's, and painter's work for 396*l*. 12*s*. 2*d*., with an additional 16*l*. for making two cellars; that Hatherell estimated all the carpenter's, joiner's, glazier's, smith's, and ironmonger's work at 283*l*. 18*s*. 6*d*.; and Parsons, the carving of the Corinthian capitals, the pineapple ornaments, with the heads and festoons in the west front, the enriching of the mouldings in the same front, in the architrave chimneys, in the Corinthian entablature round the drawing-room and staircase, and in the cornice round the hall, the cutting the trusses for the front-door case, and all the other carver's work necessary, at 55*l*. 19*s*. 4*d*.; making a total of 752*l*. 10*s*., with penalty of 100*l*. apiece for each of the three contractors if tl work were not finished to the time. A curious method is show in the payments, where the odd sums are included in tl first payment, leaving clear balances to be paid at the en showing that extras were not considered. The work had be completed in just over nine months. The cost of such building to-day would be not less than 2,500*l*.

The plan of Bath, dated 1750-1, shows the condition of tl city after Wood and others had been at work upon it, tl greater part of the newer schemes having been executed with twenty-five years.

In 1742 Wood had been engaged by the Corporation prepare plans for a new King Edward Grammar Schoo which was then being held in a disused school of St. Mar *intra muros*, in High Street. In the first edition of his bo he gives an account of the building and the money to be spen but this description is not to be found in the succeedi editions, and the present school is not his work. He sa that the site which was first chosen was in the Town Ac It would have covered about two-thirds of the present site Edgar Buildings. The present school is on the site of t Black Swan in Broad Street, and was begun ten years lat in 1752. It, too, has undergone some changes since it w first built.

Gay Street and the Circus were evidently part of the gre scheme of the elder Wood, and the whole of the laying-ou from Queen Square to the Crescent, expresses so much t thought of one mind that it seems not unlikely that his s carried it out in conformity with the lines laid down by h father. Gay Street itself rises quickly, the Circus is lev with a slight rise in Brock Street, especially just at the e on entering the Crescent, and the Crescent itself is also lev Gay Street was in building between 1750 and 1760, and he the houses have much smaller frontages. In 1753 Wood h engaged to build a house in the Circus, now No. 7, for t Right Hon. William Pitt, and in the following year, February 18, 1754, Wood himself laid the first stone of t new buildings, then known as the King's Circus. Just ov three months afterwards, however, he died, on May 23, 17 He had been a busy man, commercially successful, and n forgetful of his interests, but leaving behind such a reco of buildings as few could boast of.

Twenty-seven years before he had found Bath emergi from the squalor of a mediæval city, and far from being wh it should have been as an important inland watering-pla and during this period he had seen erected some of the m palatial groups of dwelling-houses which any city can bo of. The planning of this part of Bath marks the genius o man who laid out his schemes with a sense of nobleness a fine effect, adjusting every part to the whole and the wh to the surroundings—surroundings which had to be consider both in relation to their present aspect and their futu development. Masterly and bold in design, he grouped up t façades of his buildings in such a manner as to produce h mony and a feeling of proportion, and he added to the interi that ingenuity of planning and decorative design which h made them so full of interest to ourselves. Wood was a m who took a very capable insight into the turn events mig be likely to take, and he tried to persuade others to see wi him, but did not succeed far in this respect. Thwarted ti after time, he pushed ahead and insisted on the people of h day accepting what they certainly did not always understan He was, as was customary, frequently his own contract but though the building was speculative, it was, at this pa ticular time at any rate, not shoddy. The method of p cedure was this. The builder, who leased the plot on perpetual fee farm, or ground rent, secured a tenant for t house which he proposed to build, and as the tenants we wealthy or responsible people and the lease was for a lo term of years, it was not difficult for the builder to get h banker to finance him, and in this way most of the hous were built. For much of the good interior detail we are i debted not only to the talent of Wood, but to those build who worked under him, and who seemed to know no detail th was not correct. The Circus was divided into three instead the more usual four groups, a point which does not seem have been caused by the exigencies of the levels or other c cumstances, as the ground beyond seems to have been nothi but fields. The particular value in this arrangement evident to anyone who will compare the Circus in Bath wi Oxford Circus in London, for from whatever point you ent it an unbroken line of buildings faces you and insures t continuity of the circular form which is lost in the case the quadrants. The best-planned group of houses is th first built between Gay Street and Brock Street, where t adjustment to the radiating lines is well contrived, with a further diversity of planning to suit the tastes of the prospective tenants. Wood must have fully appreciated that the range of vision in the Circus would be small, and he has therefore with justice elaborated the work in it. The three orders —Doric, Ionic, and Corinthian—are all treated with coupled columns, and the circular lines are admirably sustained by the three unbroken cornices. The height of the façade is about 42 feet, and the parapet was originally plain, but elliptical openings and some balusters have been added here and there. The diameter of the Circus from house to house is 318 feet, or slightly larger than Queen Square. The buildings were completed in fifteen years.

(*To be concluded.*)

## COAL SMOKE ABATEMENT SOCIETY.

THE eleventh annual general meeting of the Coal Smoke Abatement Society was held at the Royal United Service Institution, Whitehall, on Wednesday, May 4, when Sir William B. Richmond, K.C.B., R.A., occupied the chair. Amongst others present were Lord Frederick Brudenell Bruce, Lady Richmond, Lady Dalrymple White, Lady Alice Des Vœux, Lady Troup, the Very Rev. the Dean of Westminster, D.D., Commander Caborne, C.B., R.N.R., Sir Lionel Spencer, C.B., Lieut.-Colonel Arthur Leetham, Col. W. A. Hill, C.B., Colonel Wild, Captain P. Wright, R.N., Dr. H. A. Des Vœux (Hon. Treasurer), Dr. Rideal, D.Sc., F.I.C., Dr. and Mrs. Owens, Miss Burnett, Mr. Thackeray Turner, Mr. Lawrence Green, Mr. William Greatheed, Mr. Alexander Ritchie, J.P., Mr. A. P. Main, Mr. Sherard Cowper-Coles, Mr. Alfred Tate, Mr. William Clifton, Mrs. Granville Smith, Miss Douglas, Miss Wilson, Mr. Henry Clarke, J.P., Mr. A. J. Martin, M.I.C.E., Mr. H. T. Smith, Miss Hollins, Miss Lucy Hollins, Mr. N. Lidstone, Mr. Bartlett Judd, Mr. A. L. Griffith, and Mr. Lawrence W. Chubb (Secretary).

Letters of apology for non-attendance were read from the Rt. Hon. the Earl of Meath, K.P., the Rt. Hon. the Lord Northcliffe, the Rt. Hon. the Lord Eversley, the Hon. Rollo Russell, the Rev. Canon Horsley, the Rev. Canon Wilberforce, Mr. N. L. Cohen, L.C.C., Mr. Henry J. Wilson, M.P., Mr. George Goodwin, Mr. White Wallis, Mrs. Fothergill Robinson, Mr. John B. C. Kershaw, F.I.C., Professor Meldola, F.R.S., and others.

The CHAIRMAN, in proposing the adoption of the report, said:—It is over ten years since the Coal Smoke Abatement Society was initiated. Year by year it has acquired greater local influence, which now is being extended to many provincial towns, and in the manufacturing centres of Scotland. We have to recognise, and at once, the loyalty of our subscribers, whose trust in our exertions has enabled the officers and Committee of the Society to work often against odds.

When we started to work everything was against us. The public for the most part called us faddists, the county and borough councils were wound with red tape and supine, the clauses relating to smoke nuisances in the Public Health Act (London) of 1891 were practically in abeyance. "Put down 'smoke,' and you injure trade; interfere with the rights of the Englishman to commit as many nuisances as he pleases, so his pocket thrives, is anti-English. What does a little smoke matter? it is wholesome." These and many other excuses were rife, and they were believed to be real and fundamental. Things have changed, and are more and more changing; the County Council is alert, and for the most part the borough councils are considering their ways, and are really beginning to view the smoke nuisance as an unnecessary evil. In consequence of this change of opinion you will all admit that each year "the London particular" is rarer. Rarer in occasion as well as density. The old blinding poison of smoke-laden fogs is becoming a thing of the past; indeed, though we have passed through the dampest summer and winter almost on record, fogs have been rare, and smoke fogs next to none during the past year. Public opinion, instead of being against us, is with us; and we may promise to Londoners that smoke from factories, and all other enterprises which come under the purview of the Act of 1891, will in time be practically eradicated. Whether it is to be so depends a good deal now upon the success of the London County Council in obtaining the deletion of the word "black" from the clause; if that energetic body is authorised to deal with all smoke which is injurious and unnecessary, prosecutions will be rendered easy, quibbles as to what is black, brown, or grey will cease, and manufacturers, seeing that their door of exit from the terror of the law is closed to them, will very promptly accept the situation, act accordingly, and finally thank the Council for reducing their annual coal bills. Because all smoke, grey, brown, or black, is waste fuel; they will find it cheaper in the long run to burn all their fuel than to let a large percentage pass into the air as waste. There is another and very important alteration of the law which the County Council is endeavouring to obtain. All premises belonging to the Crown are at present immune from proceedings for nuisances. The County Council seeks power to deal with this and other anomalies. One would have thought that Crown property should be the first to be productive of obedience to laws made under the sanction of the Crown. Surely a Government is a pretty powerless one, any how morally, which sets itself above the laws it has put in motion and raised into being. The London County Council also seeks power to take up important smoke prosecutions at the invitation of borough councils and apply the law. This will have a very far-reaching effect, for the borough councils have already more work than they can do efficiently; besides, it will release councillors from the unpleasant duty of prosecuting each other; however stern a duty it may be to do so, it is against human nature to do it willingly.

Perhaps the time may come when duty towards the whole community is a command of greater importance than to one's acquaintances or even friends.

I hope you will all read our report for this year, which not only sets out what we are doing, but also testifies to the strong action proposed by the London County Council, and, moreover, not only read it, but give support directly or indirectly to the London County Council.

Probably in no city in the world are there contained more valuable works of arts and crafts than London possesses. We, in a measure, are owners of these valuables; they are as trusts to pass on unsoiled to future generations, and we are bound, if we value them, to use individual and collective energy towards their preservation. Coal smoke contains acids which destroy stone—even marble—injure metals, eat into fabrics, burn their way into painted surfaces, and where they do not destroy they leave a stain which no solvent can remove, save one of a strength and character that would destroy the surface of a fabric or material. This fact, and it is a fact, and not a fancy, was an almost entirely concealed truth from by far the majority of even intelligent people, who imagined, as some do still, that smuts are just as any other dust is, which may be removed by a brush or a little friction. Nothing can be further removed from the truth than this idea. In every "smut," however small, there is strong sulphuric acid, sharp to the taste, burning to the tongue, which is left as a deposit or a kind of grease when the dry particles of the smut have been brushed or wiped away. The sulphuric acid remains as a corrosive element, perhaps invisible, but still there, performing its destructive functions. This action in time becomes cumulative, slowly disintegrating surfaces until the poison, eating in deeper and deeper, finally arrives at the heart of any material, as I have said, even of stone.

You will hear to-day from the Dean of Westminster how precarious the condition of the stone of our Abbey is, and I think you will all agree that, miserable as it is, years have been permitted to pass by when the evil might have been remedied by firm legislation. Now, living as we presume we do in a highly scientific and enlightened age, we, being morally guardians of irreplaceable treasures, should set ourselves to preserve what remains, and see that the mischief which has occurred—though it be irrevocable—shall not continue. So insidious is this coal dust, so penetrating also, that objects of art are only partially protected from it by glass. Unless a picture, or a glass case, is hermetically sealed at the sides, and in the case of a picture at the back of it, only a few months will prove the persistent energy displayed by the enemy, for on removing a glass from a picture improperly sealed, the inside of it will be found to be covered with a thin greasy film, which is an oleaginous product from sulphuric acid.

Upon this subject the general public is becoming slowly but surely enlightened. Let us take advantage of that fact by, instead of relaxing our efforts, redoubling them; then when we have effected the powers which are granted by the law touching upon smoke generated in public works, and private and commercial enterprises, we can urge the public to consider if the present system of burning coal for warming purposes in our households is either the most efficient, the most cleanly, or the most economical which can be devised. Better than all the words is the evidence of an admirable map made by our inspector, Mr. Petty, who has prepared this map of London and its environs to show the chimnies which have been brought to book under the jurisdiction of the London County Council and borough councils. Central London has been well dealt with, and is now practically immune from smoke from factories. We have sent in thousands of reports both to the London County Council and the borough councils which, especially in the case of the former authority, have been treated with respect and sympathy; indeed, it may be said that we are working with the London County Council, and we wish we could claim such allegiance and help from all the borough councils.

Difficulties have arisen in regard to their action from a decision by Mr. Curtis Bennett *re* smoke from the huge generating station of the District Railway at Lots Road, Chelsea. Mr. Curtis Bennett insisted upon being satisfied that in a literal and technical sense "black" smoke was emitted. "Black smoke" is almost impossible to prove, its appearance in colour and tone depending largely on the brightness, or the reverse, of the sky; the time of day, morning, mid-day, evening, or night. What is in reality black smoke may look pale against a thunder cloud; the same may look black against a grey sky, or brown-grey against white cumuli clouds. With the rays of the setting sun it may become almost red. Indeed, black is ever varying in intensity and appearance of substance under each fresh condition of light. So that though every particle contained within the volume of smoke is, in fact, "black," it may not appear to the eye to be so. The deletion of the word "black" will overcome this difficulty, and we hope that the London County Council will secure the passage of the clause, when its members will indeed be more than local, they will be national benefactors. The map also indicates the manufactories which are situated in West Ham, Chiswick, and on other parts of the banks of the Thames, not under the jurisdiction of the London County Council, but under the councils of their neighbourhood, whose control is finally subject to the Local Government Board, hitherto entirely neglectful of its duty under the Act. Hence you will find that the main factory smoke from which London suffers proceeds from these quarters.

If the London County Council gains its case, all these environs will be subject to its control, and, being taken from the hands of local and Government boards, there is every hope they will be efficiently and promptly dealt with. Anent the proposals of the County Council which are receiving active support from your Committee, I refer you to the statement in the report, from which you will conclude that the Council is in earnest and means to do its best to put down a serious nuisance.

Alas! it is always a necessity, as well as an unpleasant task, to beg, but we must do so. We are solvent—that is almost all we can say; and it is wonderful how much influence is maintained and work accomplished with a very small income. Yet, had we more money we could double our facilities of operation; we could add another inspector, a much-needed item, which we are not in a position to afford; for though our single inspector is all that could be desired, he has too much to do to cover all the ground single-handed. Had we another as efficient as Mr. Petty we could double our observations and reports, thus giving us greater power to assist the London County Council in its meritorious efforts for reform.

I think it cannot be denied that, however warmly responsible bodies have been drawn to give grave attention to the smoke nuisance, our little Society has been the originator of all subsequent interest and action. It may be reasonably advanced that if the Coal Smoke Abatement Society were to have to die out, the chances are that the old state of apathy would be renewed. An independent society is a free lance—it has no red-tape restrictions on its power to act; no one belongs to it because there is an axe to grind; it is composed of enthusiastic and practical men who, seeing a very grave evil, attempt to combat it by perseverance and hard work.

This being so, I must dismiss false modesty and frankly ask you to use your influence to obtain more subscribers, giving you the assurance that the Committee of the Coal Smoke Abatement Society will use the money subscribed with care, wasting none of it, applying all of it scrupulously to the attainment of the objects of the Society and of all good citizens—a cleaner, healthier, and brighter London.

Dr. H. A. Des Vœux, M.D. (Hon. Treasurer), in seconding the resolution that the report and statement of accounts should be adopted, spoke of the difficulties which beset the path of the Society. There was the difficulty of getting local authorities to take action against manufacturers for smoke nuisance. Again, when a conviction was secured the fine was so small that it became little more than a cheap advertisement for the culprits proclaiming that the works were busy. All this, however, is to be put an end to at Bradford, where the Corporation have just succeeded in obtaining powers by which a penalty of 5*l*. will be levied for the first offence, 10*l*. for the second, and for each subsequent conviction a fine double the amount of that imposed in the preceding conviction, providing that the maximum amount does not exceed 50*l*. The Coal Smoke Abatement Society had been called a prosecuting society and a persecuting society: but it was neither the one nor the other. They believed that smoke was harmful not only to the public but to the manufacturers themselves. Dr. Des Vœux mentioned the case of the Central London Railway, which had two large chimnies at their power station from which black smoke was vomited all day long. The Hammersmith Borough Council served a statutory notice; and, as the nuisance continued, the company were prosecuted in the police court, where a conviction was obtained. The Railway Company took the case to the Court of Appeal on the argument that they were bound under statute to run trains, and that this could not be done without the emission of smoke. The Court of Appeal, in confirming the previous decision, said that the company should have thought of that before they obtained their special Act. The result has been that steps were taken to abate the smoke, and by so doing the consumption of coal was reduced from 1,100 tons per week to 600 tons, and in addition they are now able to use a much cheaper quality of fuel. Dr. Des Vœux, continuing, said he had been living in a house near Oxford, and he had been able to study the question of the decay of the stonework in all the various colleges. The conclusion he had arrived at was that it was almost entirely due to black smoke. The decay caused by that agency was to be seen in all its stages; first, there was a preliminary blackening, which continued getting darker and darker, then blisters were formed over the surface, and ultimately these burst, showing the decayed stone underneath. Dr. Des Vœux concluded by making an earnest appeal for more funds. From the audited balance-sheet it would appear as if the Society had a substantial surplus; as a matter of fact, they were in debt.

The resolution, "That the report and statement of accounts, as submitted, be adopted," was then carried unanimously.

Lieut.-Colonel Arthur Leetham proposed, and Colonel W. A. Hill, C.B., seconded, the resolution, "That the present elected President, Vice-Presidents, Council, and Officers of the Coal Smoke Abatement Society be re-elected." This was also carried.

The Very Rev. the Dean of Westminster, D.D., then proposed:—"That this meeting, recognising the harmful effects of coal smoke on life and property, pledges itself to support the efforts of the Coal Smoke Abatement Society in diminishing the evil." He said he had attended the meeting because he thought it was desirable that attention should be called to the effect of coal smoke upon the great buildings in London, and more especially upon Westminster Abbey. He had come to express his own desire to see the Society prosper, and to recognise gratefully the interest which they had taken in the Abbey and in the efforts of its custodians to counteract the evil being done there. It was to them a very old story; the nuisance was far from being a recent thing. At the time when Sir Christopher Wren had been hard at work on the rebuilding of St. Paul's he was called in to deal with the practically ruinous condition of the Abbey Church of Westminster. It was no doubt due to his timely aid that they owed the present stability of the fabric. It appeared that Dr. South spoke to him of the condition of the fabric, and asked what it would cost to put right. Wren replied that if they did not take care one of the great columns would fall, and they would then have to pay a very great deal more than they expected. The result was that he was called in to advise and to repair the building. It was interesting to find that in a book published in 1683, and entitled "Monumenta Westmonasteriensia," the writer, H. Keepe, describes the exterior as follows:—"On the north porch you rather behold a skeleton of a church than any great comeliness in her appearance, being so shrivelled and parcht by the continual blasts of the northern winds to which she stands exposed, as also the continual smoaks of sea cole, which are of a corroding and fretting quality, which have added more furrows to her declining years so that little of her former beauty now remains." The Dean said that he always recalled that passage when thinking of the great debt of gratitude they owed to Sir Christopher Wren. It also showed that the evil of which they now complained grew with growing London. The nation had thought it right that the church in which its kings were crowned and buried, and the ashes of its great men lay, should be maintained to some extent out of national funds. Parliament voted considerable sums, appropriately enough out of the coal duties; and by means of this subsidy the Abbey was put into thoroughly sound repair. When, in 1855, the City Coal Tax was proposed to be extended for one more year to enable the Corporation to purchase a vacant piece of ground near St. Paul's, *Punch* remarked that would only be fair, as it would be "so much conscience money from the chimney-pots of London." At another time *Punch* referred week after week to the destruction of the new Houses of Parliament by the atmosphere almost immediately after erection. What was happening at the present day was that almost every kind of stone in the Abbey Church was showing constant and increasing signs of deterioration, and there could be no doubt that this is due to the products of burning coal. For the last fifteen years they had been fighting the evil as best they could with the aid of scientific advice. They had tried almost everything suggested to them. Not in every case upon the stones—but in out-of-the-way corners experiments have been constantly made on a small and sometimes on a large scale. It sometimes happened that they coated two, three, or more stones which were near one another and under the same conditions with different preparations, and then, after an interval, compared the results. Of course, no experiment was fully satisfactory until the effects have lasted thirty years; but some failed within six months. He was sorry to say the Baryta treatment, which was tried at considerable expense again and again, proved a failure, although many many coats were applied, indeed, as many as were asked for. Yet at the Bell Tower, Chichester, this treatment had proved a complete success; but in London it was otherwise, for the results have been as disappointing here as they have been satisfactory there. However, they hoped eventually, partly by experiment and partly by scientific advice, to discover something that will help to stop the stones from peeling. The Dean said that some years ago he went with the late Mr. J. T. Micklethwaite, their architect and surveyor, on to the outside of the roof over the south transept. Mr. Micklethwaite picked up a piece of carved stone; this proved to be the arm of a statue of St. Peter, which had been put up twenty or twenty-five years previous, and which had been so eaten away by the corroding influence of the air in that brief period as to have fallen. The great north front was in a terrible condition, although its repair was commenced by Sir Gilbert Scott and continued by Mr. J. L. Pearson. This was not due to bad building nor carelessness in choosing the stones, for both these two architects did everything possible. At present wherever they put in a new stone they are obliged to use the grim Portland stone, as it stands the insidious atmosphere better than anything else. It is, however, no stone for carving, though good for many purposes. It seemed almost cruel to coat the Abbey with a substance so different from that which the early builders loved to employ; but strength they must have. Happily the interior of the Abbey is safe. If the Society could devise a remedy, say in the way of the discovery of a smokeless coal, they would gladly stop their costly experiments. All interested in the Abbey ought to recognise that the efforts of the Society should be supported. The Dean said he had to confess that in their little way those living in the precincts were themselves doing daily mischief. In 1606 sea coal was first used in the great kitchen of the College Hall; it was to be presumed that ever since the harm has been continuing. He asked, "Can we do anything not merely to stop the nuisance which comes from manufacturing chimnies, but the still more persistent and numerous outbursts which come from the chimney-pots of London?" If the Society can help in that they will have done much.

Dr. S. Rideal, D.Sc., F.I.C., in seconding the resolution, said the blackness of the smoke was not the evil to which they objected, for it was simply an indication of the hidden dangers to which not only people's lives but their buildings also were subjected. It would be good if the word "black" were removed from the Act of Parliament, and smoke generally was looked upon as a nuisance. Many people thought that by the adoption of electric heating they would be contributing to a diminution of the smoke pall. But against this it must be remembered that electric generating stations were among the worst offenders. Heating by gas was a different matter, for the gas companies were prohibited by law from using coal which contains more than a certain percentage of sulphur. If all heating in London were effected by gas he was confident that 90 per cent. of the harm wrought by the sulphurous acids cast out with smoke would be obviated.

Dr. J. Owens, M.D., A.M.I.C.E., exhibited a sample of the deposit which he had removed from a factory chimney where measures had been taken to ensure the perfect combustion of the fuel without the emission of smoke. The deposit was ash and not soot, showing that the nuisance could be avoided. There was, he maintained, a very great necessity for an official Research Department, to fix definitely the irreducible minimum of smoke which might fairly be allowed to be emitted from factory chimnies, and it was equally necessary that some simple but effective standard of smoke measurement should be devised. In such matters there ought not to be dependence on the work of societies.

The thanks of the meeting to Sir William Richmond, K.C.B., R.A., for his Presidential address were expressed in a motion moved by Commander Caborne, C.B., and seconded by Sir Lionel Spencer, C.B., and in replying the Chairman referred with gratitude to the help which the Dean of Westminster had given the Society by his eloquent speech.

## TOWN PLANNING REGULATIONS.

THE Local Government Board have forwarded to the London County Council, Town Councils, and Urban and Rural District Councils copies of Regulations which have been issued for regulating generally the procedure to be adopted with respect to the preparation or adoption of town planning schemes, and for making provision in regard to certain other matters in accordance with Section 56 of the Housing, Town Planning, &c., Act, 1909. A provision is also included prescribing the manner in which any objection should be made to the approval of the Board being given to a scheme. The following covering letter accompanies the Regulations:—

The Regulations are drawn so as to be of general application. They will extend on the one hand to schemes which relate to small areas or contain only proposals of a simple character and affecting few interests, and on the other hand to schemes which may deal with extensive areas and affect numerous ownerships and other interests and involve serious considerations of expense. It is probable that the circumstances of particular cases will be such as to require or justify some relaxation or alteration of the Regulations in their application to the case, and the Board have, with a view to meeting any such case, included in Article 34 provisions which will enable them, subject to the proviso to that Article, to dispense with or vary any requirement of the Regulations where reasonable cause is shown.

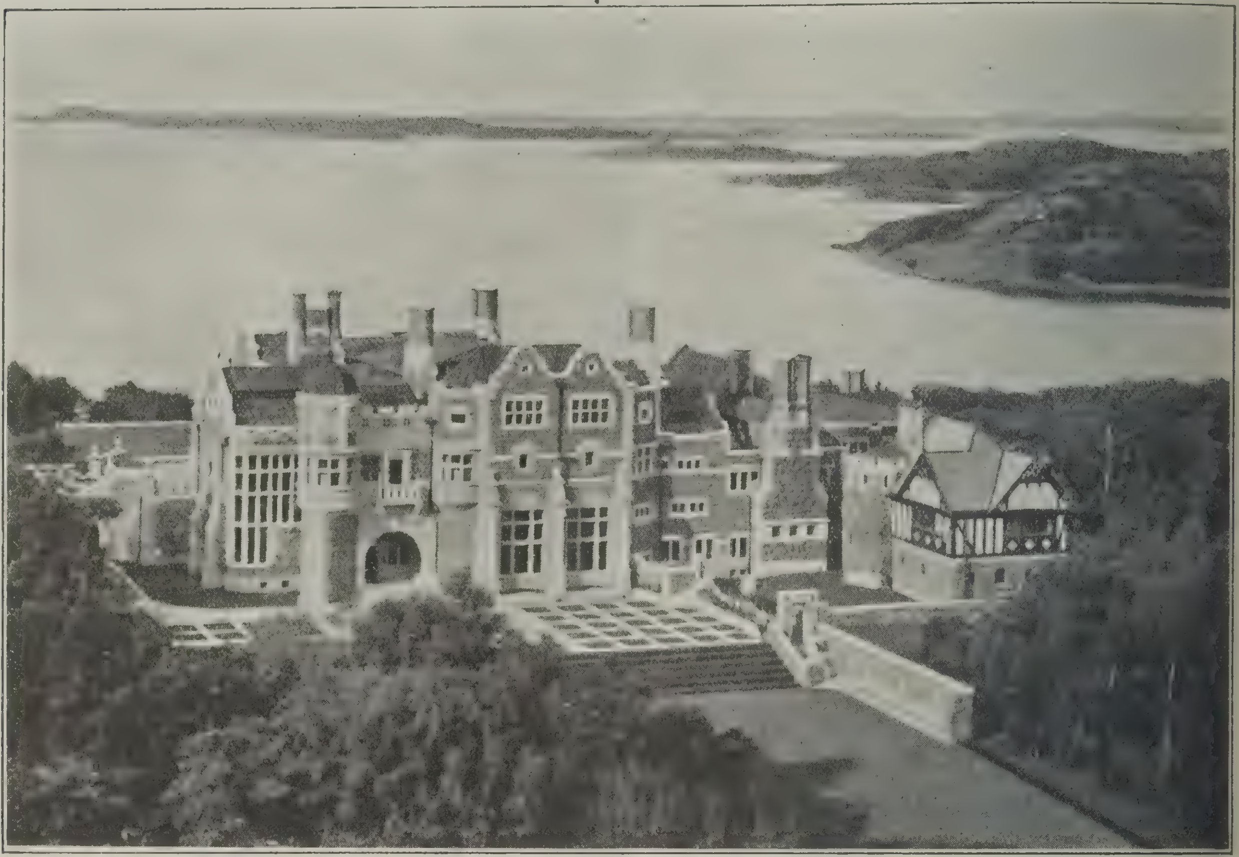
In the absence of authority for departure from any provisions of the Regulations, great care should be taken to comply strictly with them, as any failure in this respect might involve considerable delay and expense.

In the circular letter which they addressed to town councils and urban and rural district councils on December 31, 1909, the Board drew attention to the importance of co-operation on the part of the local authority with the owners and other persons interested in the land proposed to be included in a town planning scheme. The Board desire again to emphasise this point. Sub-section (2) of Section 56 of the Act enacts that provision shall be made by the Regulations "for securing co-operation on the part of the local authority with the owners and other persons interested in the land proposed to be included in the scheme at every stage of the proceedings, by means of conferences and such other means as may be provided by the Regulations." The Board have included provisions on this subject in the Regulations, which also contain provisions requiring notices to be given at various stages of the procedure to owners and other persons, including local authorities or companies, interested or affected, and facilities to be afforded to all such persons to place their views or objections before the local authority, or, at the later stage, the Board.

In a case in which the owners of land propose a scheme for the adoption of the local authority, the Board consider it very desirable that the local authority should, before applying to the Board for authority to adopt the scheme, obtain from the owners definite information or undertakings on the question of any compensation which might become payable in respect of property injuriously affected by the scheme in the event of its becoming operative, whether in respect of property of the owners proposing the scheme or of the property of any other person. Under Section 58 (1) of the Act any compensation payable in accordance with the provisions of that section and Section 59 would be payable by "the responsible authority" referred to in Section 55 (2), that is to say, the authority who are to be responsible for enforcing the observance of the scheme and for the execution of any works which under the scheme or Part II. of the Act are to be executed by a local authority. In regard also to a scheme proposed to be prepared by a local authority, it appears to be a matter of the greatest importance that these provisions as to compensation should be carefully borne in mind from the earliest stage of the proceedings and that, as in the case of the proposed adoption of a scheme, the local

## MODERN EUROPEAN ARCHITECTURE.

### DENMARK.



[From *Moderne Bauformen.*

SCHLOSS TJOLÖHOLM, COPENHAGEN.—Herr L. J. Wahlmann, Architect.

authority should endeavour to secure definite agreements with any person who may be affected by the proposals.

In regard to the provisions of Section 58 above-mentioned the Board are aware that questions have arisen as to the meaning to be attached to the words "by the making of any [or a] town planning scheme" in Sub-Sections (1) and (3) of the section. The Board have no authority to determine the interpretation to be placed upon provisions in the Act, but they are advised that, in giving effect to the section, no loss in value or gain in value of the property affected which is not due solely to the making of the scheme can be taken into account. There will no doubt be exceptional cases, but as a general rule the loss or gain in value would seem to depend upon a comparison of the full value of the property immediately prior to and irrespective of the making of the scheme with the full value of the property immediately after the making of the scheme, regard being had to the provisions of Section 59 of the Act.

In preparing the Regulations the Board have been desirous of limiting as far as possible the specific requirements to be complied with for the purpose of an application to the Board for authority to prepare or adopt a town planning scheme, and it does not appear to them that as a general rule it should be necessary for a local authority to incur much expense at this stage of the proceedings.

The full development of the details of a scheme might, the Board consider, be reserved until after the preliminary stage is passed, at all events in the case of a scheme which is being prepared by the local authority. In ordinary circumstances the Board would probably find it necessary or desirable to direct a local inquiry before giving the necessary authority to prepare or adopt a scheme, and the Board may here repeat what was stated in their circular letter of December 31, 1909, viz., that if it is thought that at any stage prior to the submission of a scheme for their approval the assistance or advice of any of the Board's experts might tend to facilitate agreements with owners concerned or to save labour or expense, the Board will be quite ready to arrange for such assistance or advice being given.

It will be observed that the Regulations require the preparation of maps at various stages of the proceedings in connection with a scheme. In Article 18 of the Regulations express provision is made under which the maps prepared in accordance with Article 14 or Article 15 may be used for the purposes of Article 18 and be marked as required by that Article, but such user would only be permissible if the maps required under the later Article would be identical in every respect with those previously prepared for the purposes of Article 14 or Article 15. This provision has been inserted with the view of saving the expense of preparing further maps, and the Board would not offer any objection to a similar course being followed, subject to similar conditions, as regards the use of Map No. 1 (required by Article 1 of the Regulations) in lieu of preparing a further map (Map No. 2) for the purpose of Article 4. It should be clearly understood, however, that a map which has been prepared and deposited to meet specific requirements of an Article of the Regulations should not be subsequently altered to meet the requirements of a subsequent Article.

It was suggested to the Board that provision should be made in the Regulations for definite schemes of colouring being adopted in the preparation of the maps required by the Regulations, so as to provide for uniformity of practice in regard to the colouring of all maps relating to town planning schemes under the Act. The Board have not regarded it as practicable to carry out this suggestion, but they think it would be desirable that, in preparing the maps required at the several stages of a scheme, the local authority should as far as possible follow the same scheme of colouring throughout all the maps, so that, *e.g.*, if a particular colour is used to indicate some special feature on Map No. 1, the same colour should be used to indicate the same feature on any map at a later stage of the proceedings.

Suggestions have been made that contour models of the areas proposed to be included in town planning schemes should be prepared. The Board have not considered it desirable to include any provision on this matter in the Regulations, and they are disposed to think that it would not as a general rule be expedient to incur the expense of preparing such models, and that it would be found in practice that plans with contour lines drawn or coloured thereon so as to show the variations in the levels of the land would meet adequately the necessities of the case.

Under Section 54 (1) of the Act, read with Section 55 and the Fourth Schedule and Section 59 (2), it would be practicable to include in a town planning scheme provisions

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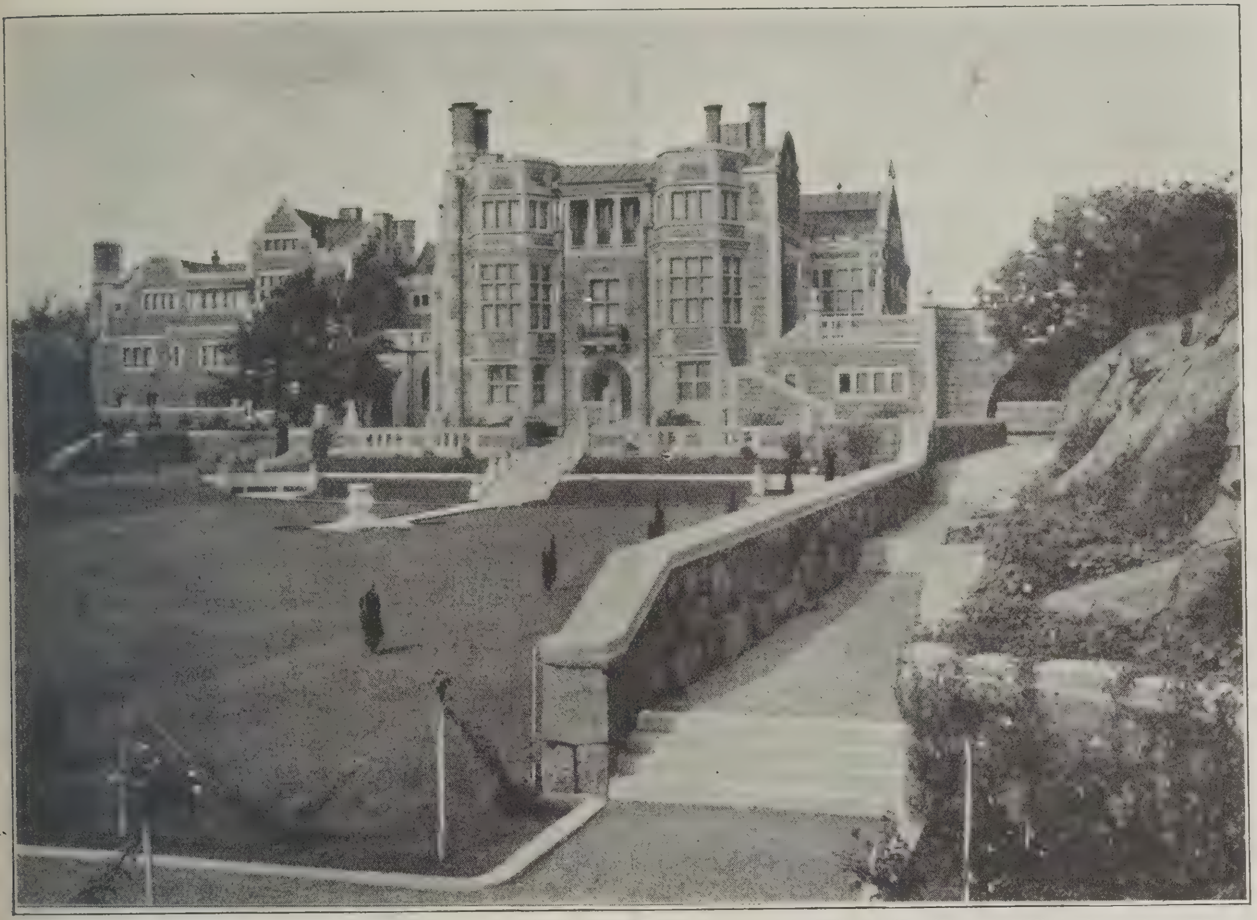


[From *Moderne Bauformen*.

SCHLOSS TJOLÖHOLM, COPENHAGEN.—Herr L. J. WAHLMANN, Architect

restricting the use of certain areas of land to specified purposes, and it will be seen that the Regulations recognise the possibility of provisions of this character. To what extent the power should be used will be a matter for very careful consideration in each case, and the provisions of Sections 58 and 59 of the Act in regard to compensation should be borne in mind in connection with the matter. The Board refer to this point at the present time as they understand that some doubt has been expressed whether the Act authorises the inclusion in a scheme of provisions such as are here referred to.

It will be observed that the present Regulations do not include provisions "in relation to the carrying out of the scheme or enforcing the observance of the provisions thereof" (Section 56 (1) of the Act), or as to "inquiries and reports as to the beginning and the progress and completion of works, and other action under the scheme" (Fifth Schedule, 3 (*b*) ). The Board propose to defer the making of any Regulations under these heads until they are in a better position for determining the precise Regulations which may be desirable.

The Board think it desirable that local authorities and others concerned in the making of a town planning scheme should realise at the outset that a considerable period must of necessity elapse between the time of the inception of a scheme and its final approval. The necessity of giving effect to the clearly expressed intention of the Act in regard to affording persons interested or affected full opportunity of considering the proposals at all stages involves considerable delay, but the Board in settling the Regulations have made the periods for notices as short as possible, having due regard to the objects to be attained. So far as administrative action upon the part of the Board is concerned, they will endeavour to expedite as much as is practicable the dealing with applications to them in regard to town planning schemes, but the careful consideration of a case in all its aspects and the arrangements for the holding of the necessary local inquiries must necessarily take a substantial amount of time.

## TOWN PLANNING IN GREATER LONDON.

UNDER the auspices of the National Housing and Town Planning Council a conference was held on Friday, May 6, at the Caxton Hall, Westminster, S.W., to consider the powers and duties of local authorities in regard to town planning in Greater London under the Housing and Town Planning Act, 1909. The area involved was taken to be that lying within a 15-mile radius of Charing Cross; and this is under the control of ninety authorities.

Alderman William Thompson (Richmond, Surrey), in opening the proceedings as chairman, said that the sooner the relation was discussed of Greater London to town planning the better. The advantages of town planning were too obvious to require to be set forth. Extreme importance must be attached to a proper co-operation between the various authorities charged with carrying out the Act. If they do not co-operate it will be to their own individual disadvantage as well as to the disadvantage of the general public. Under the Act land owners also must be brought into co-operation with the local authorities; if this is not done either party can involve the other in a considerable amount of trouble and expense. The area to be dealt with by the conference was firstly that of the London County Council—the borough councils having no town planning powers. Outside that area the urban district and rural district councils exercise power. By arranging among themselves the authorities would be able to deal with those estates which overlap. In the many problems which lie ahead it was essential that no one authority should be predominant. London was great; but they on the outside called themselves Greater London. In settling what was to be done under the Act everybody should be considered. The urban councils are empowered to prepare a town plan not merely for their own areas, but also within the borders of another authority. The London County Council, which is the authority for London itself, can do the same for areas on its fringes. There was therefore absolute necessity for unison. The urban authorities are anxious to co-operate with the London County Council, though they are nervous of doing anything which might result in their being over-ridden by the central body. With regard to the amenity of Greater London under this Act it was to be hoped that it would be possible for the local authorities to link up the parks as has been done in Vienna, and to form a kind of ring of open spaces around London. The people of Frankfort have decided to create all round the town an agricultural belt, i.e., a wide space of open land, of forest land and of agricultural land. Future development will continue on the outer side of that ring. The people of London ought to have in view the protection of the outer areas against the untrammelled expansion of bricks and mortar.

Mr. Raymond Unwin proposed the first resolution:—"This conference desires to draw the attention of all local authorities in the area of Greater London possessing statutory powers under the town planning sections of the Housing and Town Planning Act to the great importance of these new powers as a means of securing the wise development of the areas under their control. Further, this conference strongly urges each local authority to appoint a town planning committee to consider these new powers and duties." The time had gone by, he said, to say much as to the advantages of town planning. Local authorities in the past had learnt how helpless they were to adequately supervise the development of their suburbs. They were often forced to give their approval to plans which just squeezed into the four corners of the by-laws, although the buildings would, when erected, constitute a disgrace which would sooner or later have to be cleared away. The Town Planning Act for the first time gives local authorities power to prevent schemes which arranged for forty or so houses to the acre. It affords an opportunity to take a great step towards the proper development of towns in England, and more especially towards the development of the largest and wealthiest city the world has ever known. No authority could afford to sit still and do nothing towards the development of their area, if for no other reason than that should they remain passive, they would find the London County Council trying to arrange their affairs for them. Then again the local owners will perhaps be coming forward with schemes, and the authority would find themselves unprepared to deal with them. The Town Planning Procedure Regulations just issued by the Local Government Board provided ample opportunities for consultation between the local authorities. The latter should bear in mind that it was only by their taking into their confidence the architects, surveyors and builders in their district and making up their minds to pull together with them, and by working in sympathy with adjacent authorities that the Act can be made a complete success.

Mr. W. P. Harding, town clerk, Wood Green, said that this important Act would serve as a monument of one of the most illustrious ministers who ever presided over the Local Government Board. Hitherto estates have been developed with sole regard to their own amenities, and with no regard to the interest or amenities of the district as a whole. Local authorities in preparing a scheme for their own areas must for the future take into consideration what will be necessary and desirable in a comprehensive scheme for Greater London. As an instance of the advantage of co-operation Mr. Harding mentioned Alexandra Park, which had been bought by ten or twelve local authorities.

Mr. G. L. Pepler, F.S.I., said that the first thing a town planning committee should consider is what good property in the town or district is threatened by bad development in the proximity, and the best way generally in which good development can be encouraged, and existing good development preserved. The second thing was to bring the plan of the town or district up to date, marking all the new roads, finished or commenced. The third was to review the plans deposited but not approved, and also the plans approved but not yet carried out; and to see if there is no urgency to apply for powers in order to check undesirable development. The fourth was to consider the trend of development, the land likely to be next developed, and the most desirable way in which it should be developed. The fifth to consider the needs of communication and also as to road improvements that might not now be too extensive under the new powers the Act gives as to betterment, &c. In some districts it might be of great value to have traffic charts prepared in order to show the trend of traffic, and if any relief roads had already been carried out in the district, to consider whether they answered their purpose. The committee would have to consider the very important question of open spaces, seeing how existing ones answer their purpose and what are likely to be required in the future. Lastly, they would consider on what lines the development of the town or district has so far proceeded and as to what districts are therefore most easily to be retained and improved for various classes of property.

Mr. Henry R. Aldridge, the secretary to the Town Planning Council, in alluding to the Act, remarked that the clauses seem to discourage town planning; they must be read carefully three or four times before even a glimmer of their meaning becomes apparent. They are a remarkable contrast to the lucid French regulations.

Alderman Thompson, the chairman, said that when the Richmond town planning committee met for the first time there was much awkwardness, as each member wondered how they were to begin. But they finally came to the decision that they should commence by giving the surveyor a job. He was therefore instructed to draw up a preliminary report showing (*a*) land immediately in course of development; (*b*) land likely to be used; (*c*) land that might eventually perhaps be used; (*d*) land adjacent to all these; (*e*) land in other districts which might be affected by their own scheme.

Mr. R. Brown, surveyor, Southall-Norwood, complained that many of the ordnance maps, which it was suggested they should utilise, were twenty years old, and show green fields where are now bricks and mortar. These ought to be brought up to date by the Government at their own expense. The surveyors have already plenty to do without embarking on that extra work.

Professor S. D. Adshead said he had searched in the regulations for some reference as to the method of making a town plan and the extent of the area to be dealt with, but there did not seem to be anything about either point. It would be necessary, he thought, to go a good way outside the hard and fast lines of the Act. Those spots which are being developed on wrong lines would have to be treated at once, and, so as to avoid making a wrong plan, they would have to be made as small as possible. In the second stage it will be necessary to go outside the Act in considering the whole of the town in relation to authorities outside its area. In his opinion skeleton plans should be made after the small areas have been dealt with, showing the main traffic routes, and the delegation of certain portions for specific purposes. The part not likely to be developed at once could be left for later. The most natural way of grouping authorities was by their connection with the great traffic centres.

Mr. A. Steele Sheldon, town clerk, Wimbledon, alluded to the valuable help received in such questions as were under consideration from their John Evelyn Society, which had for its object the making of the more beautiful. Many of its members did not take part in the ordinary public work. Such societies should be encouraged by other local authorities and their help enlisted in the carrying out of the Town Planning Bill.

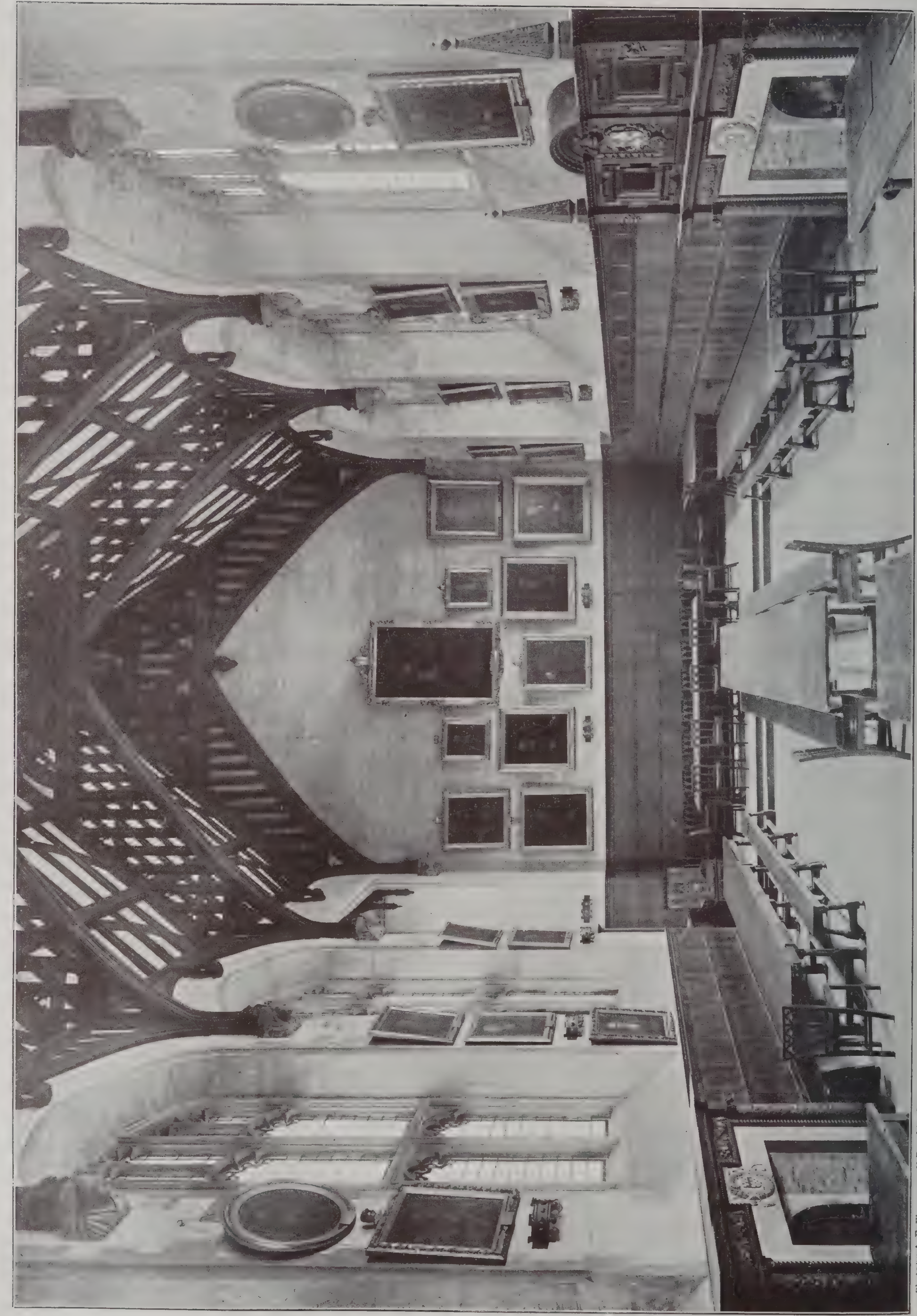
The first resolution was carried, as also was the following: "In view of the great need for securing harmonious action between all the Town Planning Authorities in the area of Greater London this Conference is of opinion that, when sufficient time has elapsed to enable these Local Authorities to appoint Town Planning Committees and to consider the reports of these committees, the President of the Local Government Board should be asked to convene a conference of these Local Authorities to consider joint action in regard to those features of town planning which affect the development and amenities of Greater London as a whole."

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) deals chiefly with the domestic work to be found in the exhibition of the T-square Club, in the Academy of Fine Arts Building in Philadelphia, as to which our contemporary claims "that in at least one branch of our architecture we have outstripped all other countries, viz. in our domestic work." Although our present Royal Academy exhibition is not as a whole superlatively strong in domestic work, and does not contain the best work of some of our best men, we are prepared to advance that the examples of United States domestic architecture, illustrated by our contemporary, would not, in the opinion of an impartial and competent critic, be found to outstrip the specimens of British design now to be seen on the walls of Burlington House. We do not claim superiority, but admit that modern American domestic design is refreshing, original and piquant, and that some excellent illustrations thereof are before us.

*La Construction Moderne* (Paris) gives further illustrations of the new Magasins au Printemps, Paris, with more details and views of its remarkable display of constructive and ornamental ironwork. In its description of old Paris, our contemporary now deals with the locality of *le Marais*.

*Engineering Record* (New York) contains an interesting paper by George W. Fuller "Concerning the corrosion of metals by water." A curiosity is a combination roof truss of wood and iron for a skating rink, 90 feet across.



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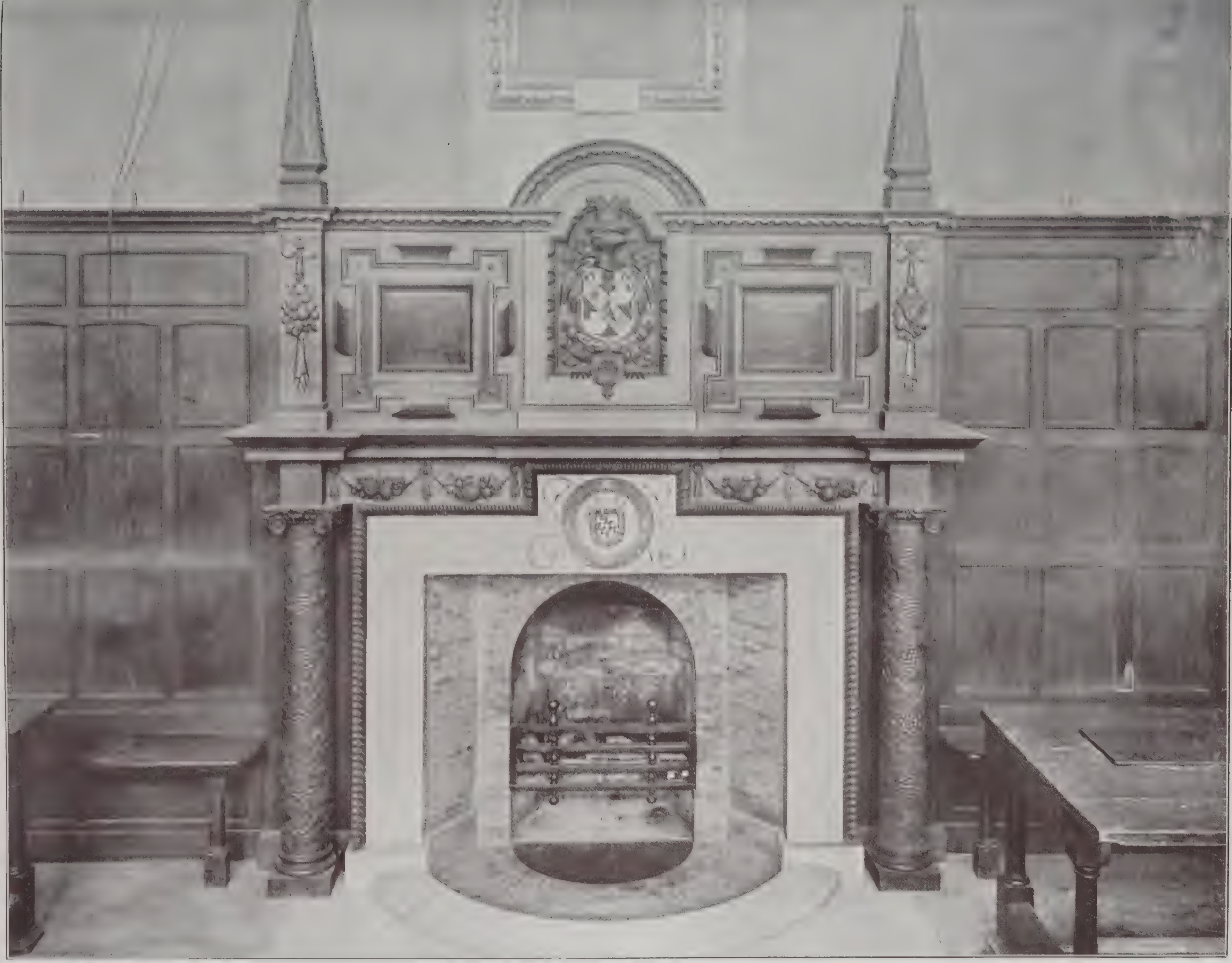

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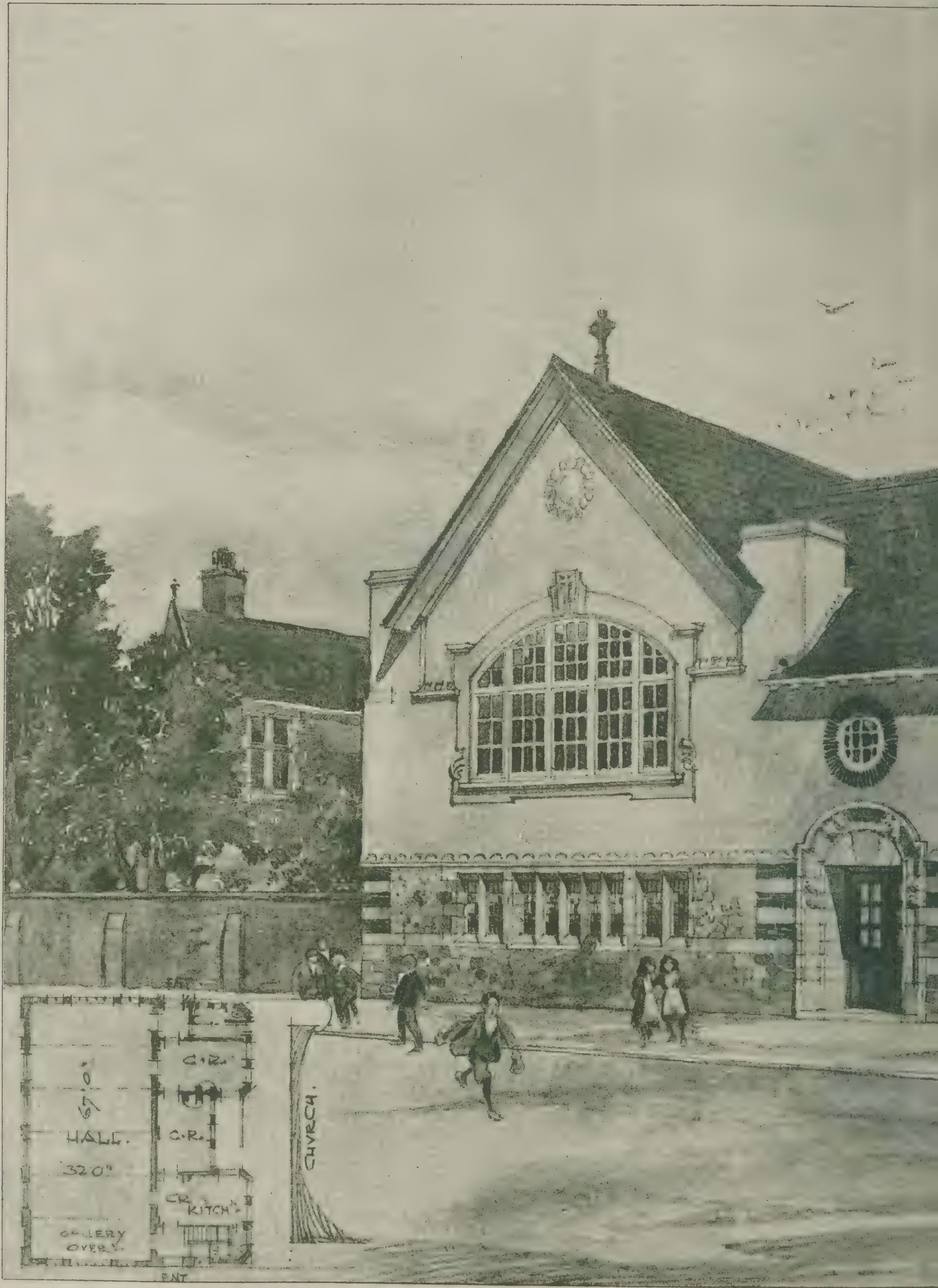

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H. P. BURKE DOWN

*Royal Academy Exhibition, 1910.*

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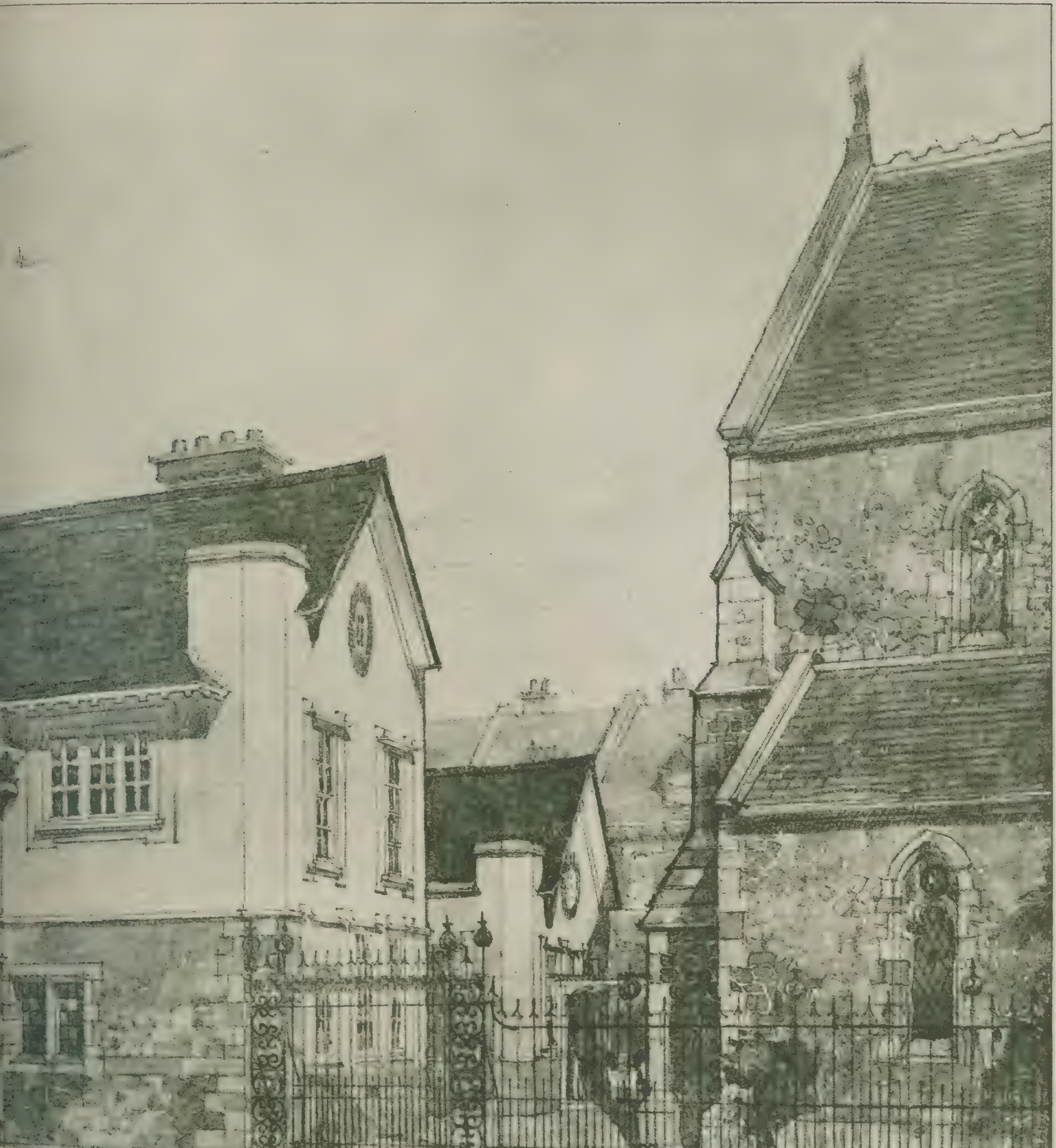

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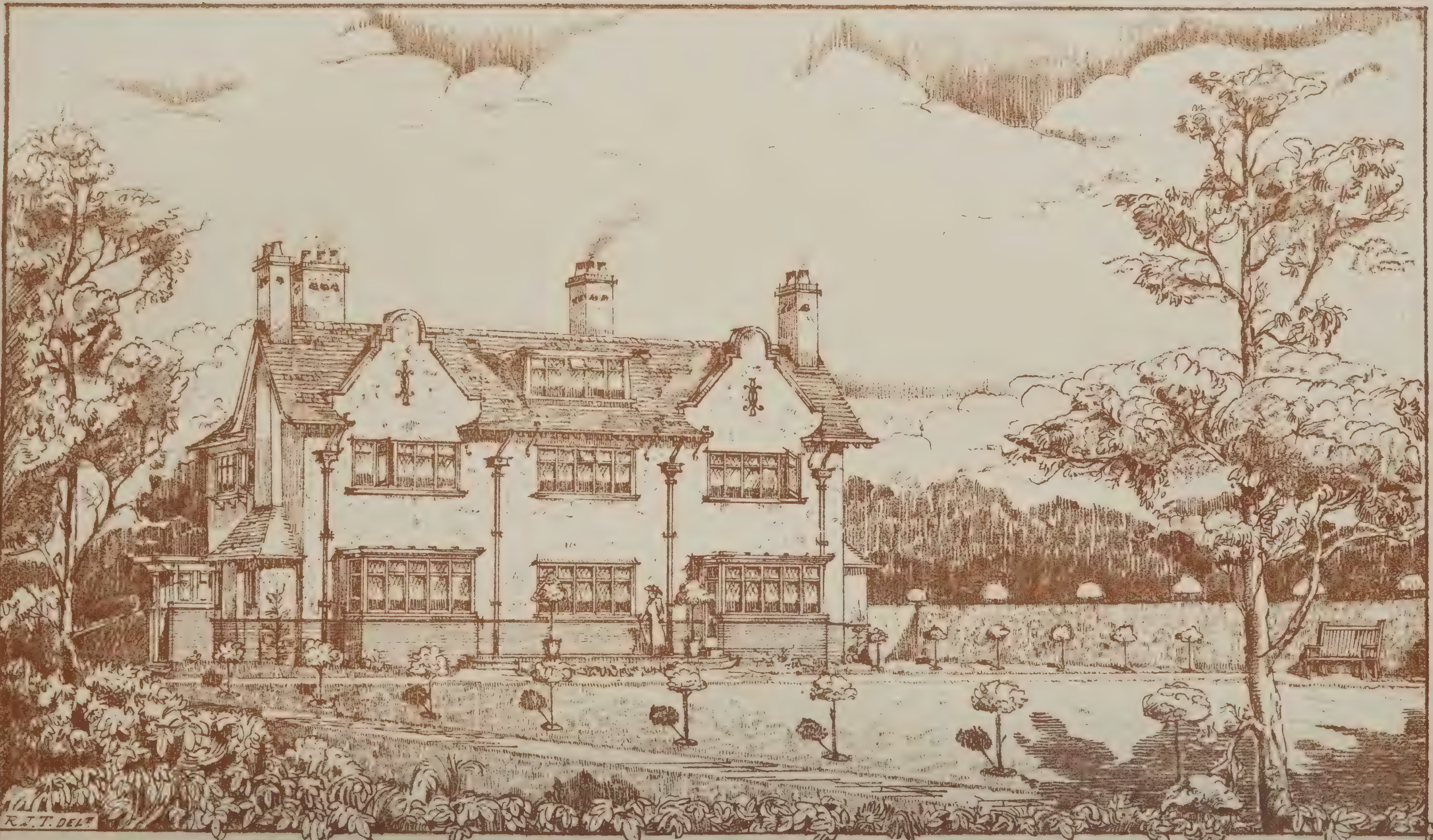

HOVSE AT WIMBLEDON FOR COLONEL SETON-CHURCHILL.
THOMSON & POMEROY: ARCHITECTS:

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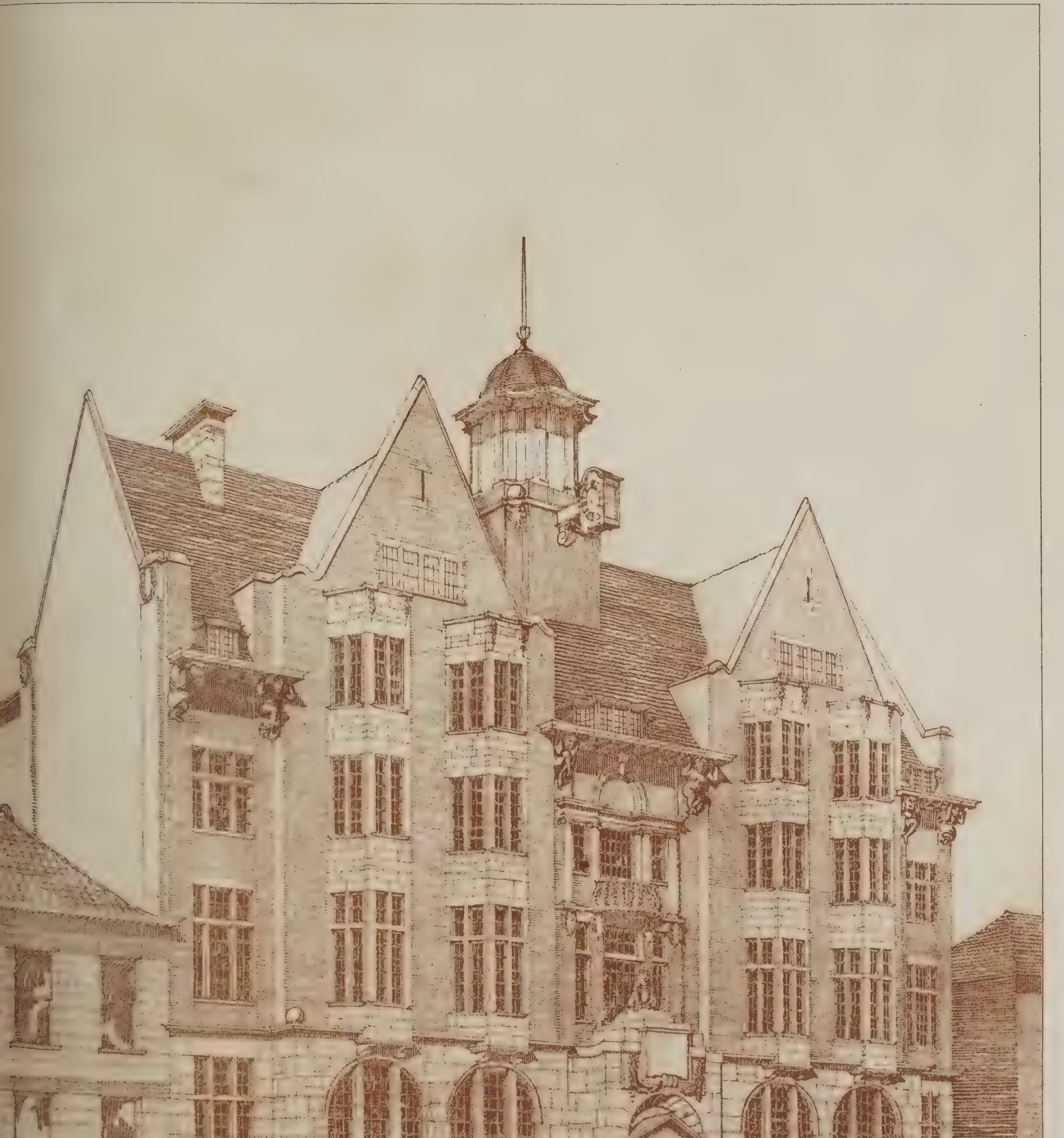

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COMPETITION DESIGN FOR NEW CLUB, SHANGHAI.

By Messrs. LOVEGROVE & PAPWORTH.

# The Architect.

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## FORTHCOMING EVENTS.

*Saturday, May 21.*

Edinburgh Architectural Association : Visit to Broomhall, Fife.

*Monday, May 23.*

Royal Institute of British Architects : Paper on "The Art of the Monument," by Mr. E. A. Rickards, F.R.I.B.A.

*Tuesday, May 24.*

Institute of Metals : Annual May Lecture ; Subject : "Metallurgy in Japan," by Professor Gowland, F.R.S., Vice-President.

*Thursday, May 26.*

Incorporated Society for Promoting the Building of Churches : Annual General Meeting.

Surveyors' Institution : Liverpool Meeting.

## ARCHITECTURE AT THE ROYAL ACADEMY.—II.

RESUMING our examination of designs for domestic buildings, we come to Mr. P. MORLEY HORDER'S "St. Peter's Vicarage, Ealing," a picturesque composition with plastered walls and tile roofs. "The Doone, Byfleet, Surrey," by Messrs. CASTLE & WARREN, assumes the guise of a cottage with plastered walls, a bit of half-timbering and thatched roof, turned into a house by an added red brick entrance porch in a re-entering angle. Mr. CHARLES R. ASHBEE sends a set of drawings showing the lay-out of garden and "Reconstruction and Additions, Woolstaplers' Hall, Chipping Campden," his own residence and an interesting house. Mr. FRANK B. DUNKERLEY'S "Cragwood, Windermere," seems a fairly big house of irregular and rather strained composition. "Beechlaw, Puttenham, Surrey," by Messrs. FORSYTH & MAULE, is a good drawing of a brick house with tile roof, modernly picturesque. Messrs. HART & WATERHOUSE exhibit the entrance of a block of flats in "The Pryors, Hampstead," which is stately without undue striving. Mr. JAMES J. S. NAYLOR in his "House in Portland Place" as in the "House in Upper Brook Street" shows stone fronts of rather elaborate detail, too much of the character of modern municipal building Renaissance.

Mr. CHARLES E. MALLOWS in a "House and Garden at Sunningdale" makes a feature of a pleasant approach of steps and lily pond to a long house of two storeys and oof with projecting wings of one storey and gabled roofs which enclose a courtyard, an idea we remember seeing in a design at the first Ideal Home Exhibition. Mr GEOFFRY LUCAS in "Proposed House near Godalming, Surrey," has a simple plain brick design with a pedimented stone doorway in the centre flanked by slight projections at the ends of the façade with hipped tile roofs. Mr. COURTNEY M. CRICKMER'S "Three Houses, Hampstead Garden Suburb," is a picturesque and skilful treatment of small house design in brick and rough-cast, being the hree centre houses of a group forming part of a hexagon of eighteen houses. Mr. A. VIVIAN JACKSON'S "House at Weybridge" adopts an old-fashioned rendering of sparse timbers and brick filling combined with tile hanging hat is a little affected.

Mr. ERNEST W. MARSHALL in a "House near Oxted, Surrey," shows a pleasing composition of plastered walls with red brick quoining and red brick dressings to windows, tile hanging, and tile roofs. In "Hanger Hill, Sussex," Mr. EDWARD T. POWELL has rather laboured to produce an effect of accidental mingling of stone base, red brick, and half-timber, but has quite caught the south country type, even to the stone slate roofs. "Proposed House at Esher, Surrey," by Mr. JOHN N. R. VINING, is a truthfully-treated half-timbered building with a brick ground storey relieved by a projecting plastered bay.

Mr. ARTHUR T. BOLTON makes a bid for originality in "The Villa in the Warren, Ewhurst, Surrey," which has an Italian cachet in its loggie and arcades, whilst the simplicity of his semicircular arches and a quaint corbelled out upper storey suggests that his thought was tinctured by reminiscences of Romanesque work. Mr. CHARLES A. BATTIE'S "House at Guildford, Surrey," has a two-gabled symmetrical front in half-timber over a stone ground storey, relieved from tameness and rendered picturesque by a cleverly introduced gable on the flank return.

Mr. ERNEST NEWTON sends a sketch of the detail of part of the front of "Upton Grey, Hants," a study of a half-timber bay to a brick and tile hung façade. Messrs. T. O. FOSTER & P. W. LOVELL also send a detail of part of the "Xavierian College Sanatorium, Mayfield, Sussex," showing the entrance and a study in red brick and plaster. Mr. EDWARD F. C. BUCKLEY'S "New Hall at 67 Queen's Gate" is rather tame and hackneyed in detail, and scarcely attains a moderate degree of excellence by the use of green marble columns. "Proposed London House," by Mr. L. MACDONALD GILL, appears to be a mansion in Carrara ware, with blue bands to the two top storeys and a green tile roof, rather a striking conception; but why mar the whole thing by introducing three commonplace red brick arches?

Mr. C. WONTNER SMITH shows in his "Small Houses at Barnet" how even the suburban villa can be made beautiful by picturesque grouping, combination of Mansard and normal roofing, brick and half-timber, and an occasional moderate expanse of plaster. In "No. 84 Harley Street" Mr. CLAUDE W. FERRIER has cleverly obtained an agreeable effect in a necessarily flat-fronted house by recessing the centre and connecting the recess to the quasi-projections with circular curves.

Mr. WALTER CAVE in "Ewelme Down, near Wallingford," gives us a charming old manor house with square tower and many gables, quite expressive of seventeenth-century feeling. Mr. H. STANTON WEBBER'S "House at Ripon, Yorks.," was published in *The Architect* of March 11. The "Tower and Garden House at Roynton Cottage, Rivington," by Mr. THOMAS H. MAWSON, looks like a tower on a city wall, say at Rothenburg, a quite mediæval effect being attained by the skilful use of varied levels in the garden and its accessories. "Extensions to House in Northumberland," by Messrs. OLIVER, LEESON & WOOD, is a study of a plastered house with stone bays and square stone dressings to windows and a slated roof.

"Great Roke, Witley, Surrey : the Entrance Front," by Messrs. H. T. BUCKLAND & E. H. FARMER, is a picturesque house, somewhat severe in tone, which would show to better advantage if the drawing were less hard. "The Moorings, Sunningdale," by Messrs. T. E. Collcutt & S. Hamp, is an exceedingly picturesque stone house with rubble walling and a quaint overhanging timber gallery. Mr. Walter Tapper in "Eastham Grange" has contrived to make a comparatively small house look big by long and narrow blocks at right angles. "Staplefield Place, Sussex," by Messrs. C. E. Clayton & E. Black, is a regular Norman Shaw type of house, with brick and stone mixture on the ground storey and half-timber and hung tiling above, with plenty of gables. A plastered house in brick plinth with red-brick arches and sills to windows and outside green shutters is made quite satisfactory by Mr. D. G. Round in "Baskets, Colchester," with projecting bays and loggia between, the whole surmounted by a yellow tile roof of simple and quiet form, effective by the use of wide overhanging eaves.

Mr. Andrew N. Prentice is not at his best in "The Manor House, Motgrove, Gloucestershire," although this is a big stone house of true Gloucestershire type. The bird's-eye view, although it shows the bigness of the house, does not favour the design. "East Weald, Bishop's Avenue, Hampstead," by Messrs. H. V. Ashley & W. Newman, is an excellent study in brickwork, symmetrical yet picturesque. Mr. Arthur P. Starkey has given much effort to the production of a symmetrical plan in his "House, North Bedfordshire," and at the same time has achieved piquancy by the introduction of flanking loggie as outdoor parlours, one opening from the drawing-room and the other from the dining-room. The scheme of the garden is well worked out in alignment with the house. "Alterations and Additions to Shirenewton Hall, Chepstow," by Mr. Norman Evill, has quite a Scots flavour about it, with the dourness relieved by a Jacobean arcaded loggia.

Mr. Arthur Keen's "Wildshaw, Limpsfield," is a picturesque moderate-sized house with a gabled oriel in hung tiling for its central feature—if we may use the term central in an unsymmetrical composition—in which an octagonal bay on one side makes a further note of interest. Asymmetry, however, is not in this case destructive of balance. "Graythwaite Hall, Cheshire," by Mr. Frank B. Dunkerley, is a study in half-timber with a multiplicity of gables, but does not conform rigidly to the usual Cheshire type. Mr. George L. Sutcliffe's "North-west View of a House" shows two wings in plaster with brick plinth meeting at right angles, with two gables hobnobbing in the re-entry angle and an entrance on splay, a piquant bit of composition. Mr. John Greaves in his "House at Sidmouth, Devon," presents a pretty little drawing in coloured chalks of simple plastered walls and much roof, studiously irregular, a glorified cottage.

"Hill Close, Braunton, North Devon," by Mr. G. A. E. Schwabe, shows how a severe and even plain building may be relieved and saved in character, in this case by carrying up a bay and high parapets to the foot of a gable. Mr. George Hornblower's "Cottages, North Wales: Frontage to Street," is a tiny coloured drawing of the elevation of a row of two-storey cottages, and is a lesson to those who are ambitious of finding a place on the crowded Academy walls.

## NOTES AND COMMENTS.

In His Most Gracious Majesty King George V. we have a monarch who has already as Prince of Wales given proof of not only interest but critical appreciation of architecture. The last two Building Trades Exhibitions, held at Olympia under the management of Mr. H. Greville Montgomery, were visited by our present King and Queen Mary, when it was remarked by those who had the honour of coming in contact with their Royal Highnesses that the visit was not simply due to the gracious condescension that we have become accustomed to expect from members of our Royal Family, but was a genuine pleasure to competent and qualified observers of whatever good or beautiful things were to b found in modern architecture. With such experience a this, coupled with the remembrance of the recent hono of patronage bestowed upon the Royal Institute of Britis Architects, we may be certain that the art of architectu will receive due recognition and encouragement at th hands of our present Sovereign, and that the loyalt and affection of all who practise that art will be unhes tatingly given to King George and Queen Mary.

The Incorporated Church Building Society has pu lished as a reprint from the *Church Builder* the valuab series of recommendations made by Mr. W. D. Caroe to the causes and evidences of decay in church building The purport of Mr. Caroe's articles is expressed in th title of the reprint, "A Manual of First Aid for Arch diaconal and other Inspections," and this is admirab adapted for primary instruction not only for archdeacon but for all clergy and churchwardens who have a ancient edifice in their care and keeping.

The valuable work that has been done since its form tion by the Hellenic Society has prompted the foundatic of a similar Society for the Promotion of Roman Studie the object of which is to deal with the archæology, ar and history of Italy and the Roman Empire down about A.D. 700 by publishing a journal, forming a librar holding meetings, assisting (as soon as funds allow) th British School at Rome, and generally promoting th better knowledge and understanding of the Roman worl A rich field is open to the new Society, and we doubt n that its success will be immediate, for spite of all th has been done by many independent investigators the are many gaps to be filled between the plots that ha been worked, which co-ordinated efforts such as may expected from a well-organised association can alo unite into a well-explored field and render complete o knowledge of the art and archæology of the Roma Republic and Empire.

Liverpool is, of all the cities of England, the mo closely in touch with the United States, and according the most strongly-coloured by American thought ar manners; hence it is natural that in Liverpool there shou be rising the first genuine sky-scraper in England, th new building for the Royal Liver Society. The ci building surveyor, Mr. John Alexander, is wise enoug in his annual report, to direct the attention of Liverpool citizens to the desirability of powers being taken, as the could be by the adoption of the Public Health Act Amen ment Act, 1907, to control the heights of buildings. we have said before, the man who erects a sky-scrap "jumps the claim," and his fellow-townsmen have suffer, for his benefit, the loss of air and light to whic they are entitled.

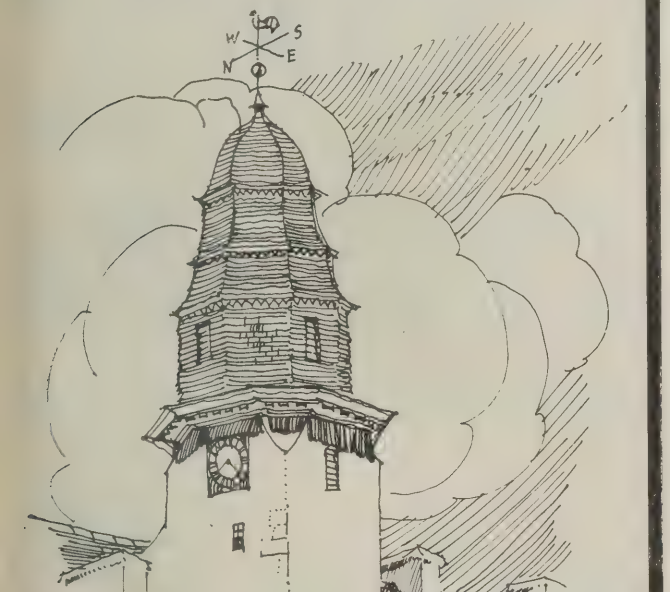
Another unpleasant result of the multiplication sky-scrapers, which is now causing serious uneasiness the minds of New Yorkers, is the terribly congested sta of such important thoroughfares as Broadway and Fif Avenue when the mammoth buildings simultaneous disgorge their thousands of occupants at certain hours the day, rendering locomotion almost impossible. Th city of Liverpool will therefore be well advised to nip the bud the rapid growth skyward of future buildings.

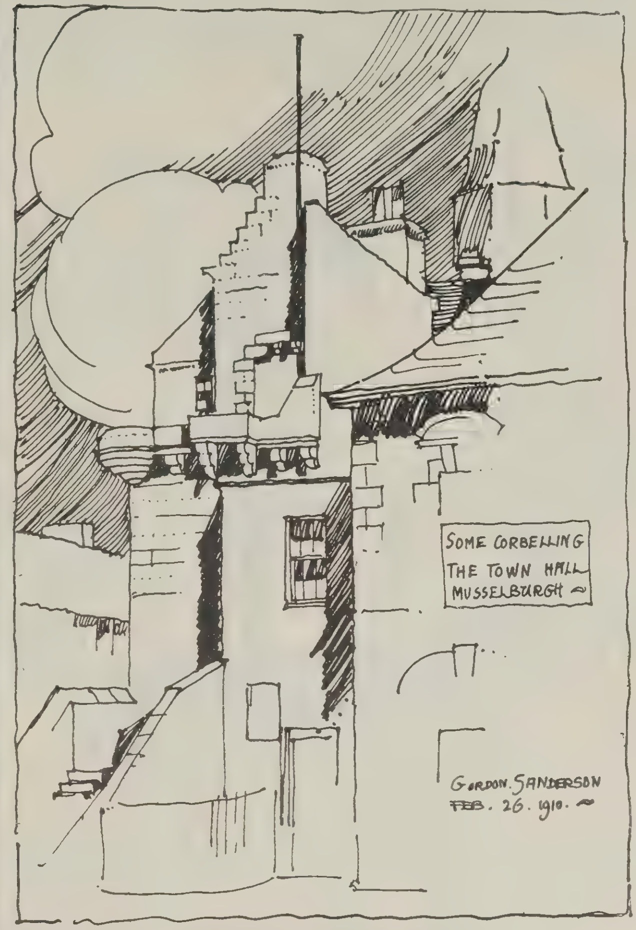
The case of Measures Bros. Ltd. *v.* Measures not only interesting to the building trade as affecting well-known firm of engineers, but lays down an importa point of law in respect of service with limited companie Briefly, the defendant was a director of the company f a term of years, with an extension at his option for further term. Before the term expired the compa came into the hands of a receiver, and an order was ma for compulsory winding up. Hence the defendant w automatically dismissed and then started in business f himself. The company applied for an injunction restrain him from so doing, and Mr. Justice Joy refused the application. On appeal, the Master of the Rolls and Lord Justice KENNEDY upheld the decision of Mr. Justice JOYCE and Lord Justice BUCKLEY dissented. Accordingly the appeal failed.

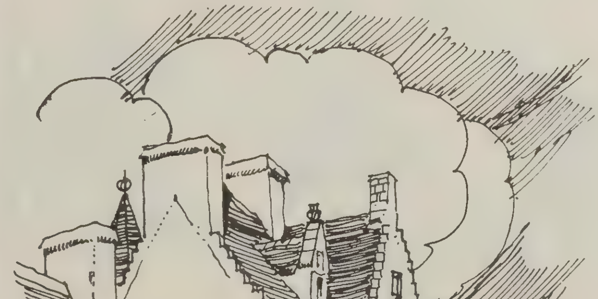
WE regret to have to announce the death of Mr. GEORGE AITCHISON, R.A., on Monday last, in his eighty-fifth year. His practice as an architect was in his early years largely shaped by the inheritance from his father of the position of architect to the St. Katharine's Dock Company, and it was not till the erection of Sir FREDERICK LEIGHTON's house that he had an opportunity of showing his ability as an artist. He was an example of the learned student, particularly of Classical architecture, which fitted him eminently for the position he held for many years of Professor of Architecture at the Royal Academy. He was President of the Royal Institute of British Architects for the years 1896-9.

## NOTES AND SKETCHES ON ARCHITECTURE ROUND EDINBURGH.

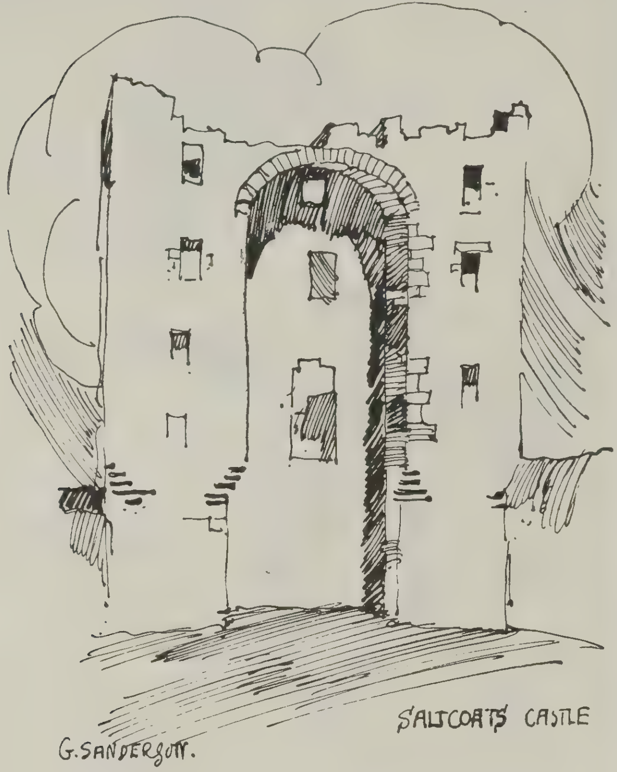
THESE sketches were made in the immediate neighbourhood of Edinburgh, which is, like the city itself, singularly rich in excellent examples of old architecture. Those that form the subject of this article are by no means the only ones, but they will serve to show the individuality and charm of Scotch work. They may also give an added interest to anyone visiting the locality who has hitherto been ignorant of the existence of such interesting instances of architecture.

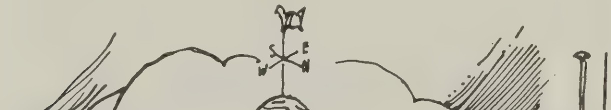




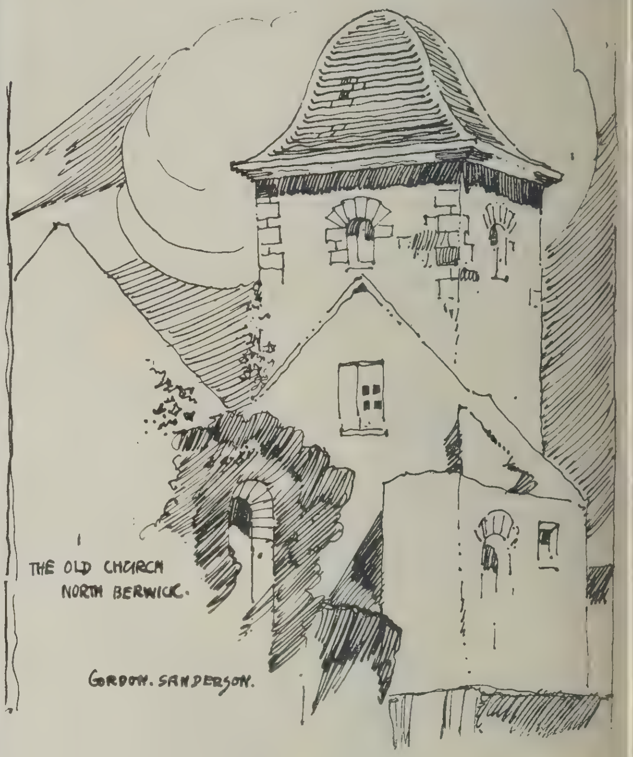

AT PINKIE HOUSE
GORDON. SANDERSON.
FEB. 26. 1910.

*Musselburgh.*—Besides being historically most interesting owing to its close connection with Scottish national history, Musselburgh is also of great interest architecturally. The town hall, the spire of which is perhaps the town's most striking feature, is the work of Dutch fishermen who had settled there in the fifteenth century. The municipal buildings form a charming group and are quite continental in their general appearance. There are also many old tile-roofed houses in the town, which give it a pleasing touch of colour.

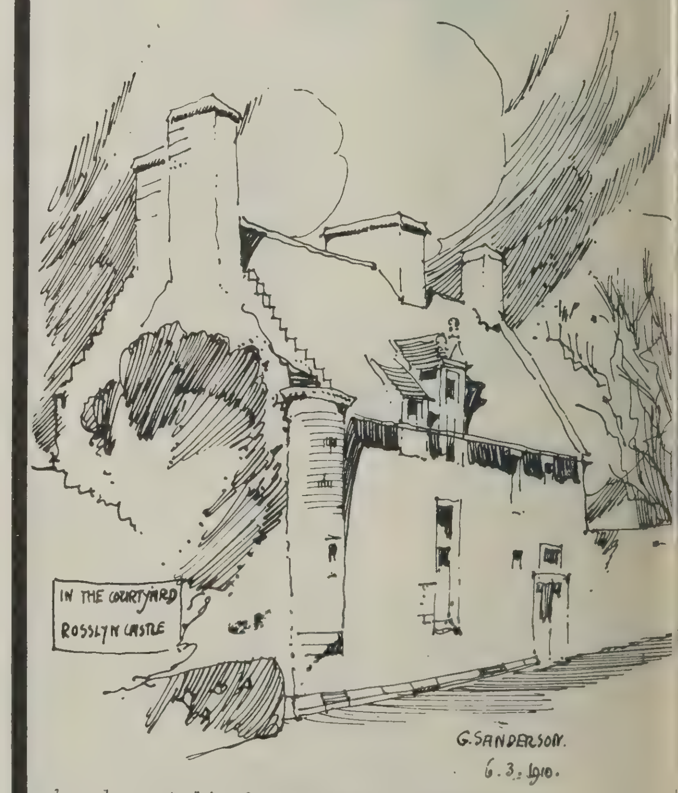



THE TOWN HALL
NORTH BERWICK
G. SANDERSON.
MAR. 4. 10.

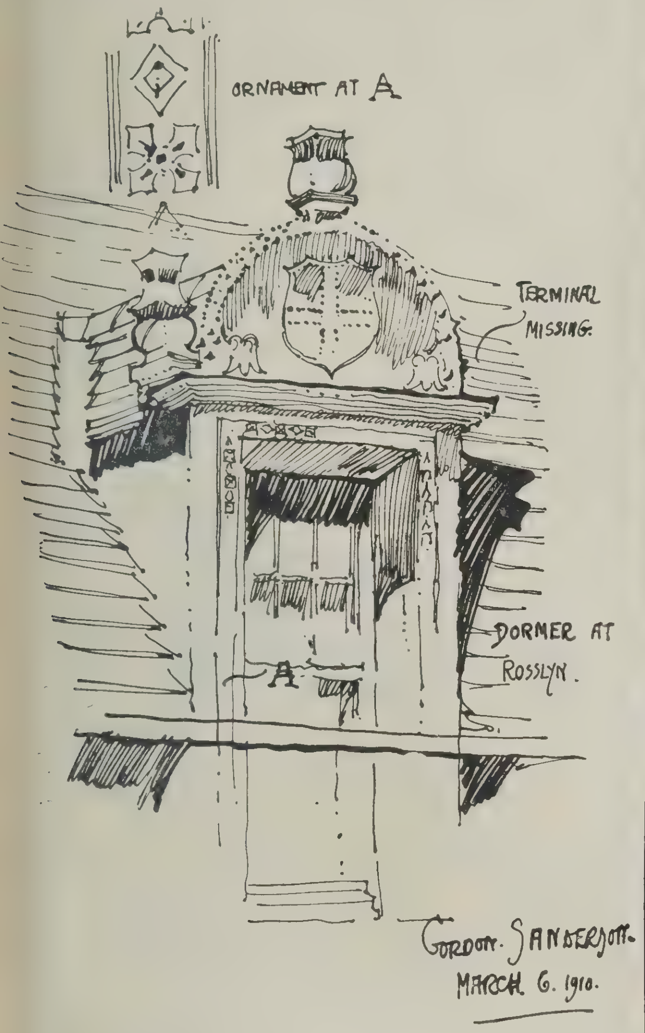
*Pinkie House, Musselburgh.*—Scotland owes a debt of gratitude to the Seton family for endowing her with many fine specimens of architecture. Alexander Seton, Earl of Dunfermline and Chancellor of Scotland, erected the principal parts of Pinkie House in 1613, to which various additions have taken place at later dates. His original design appears never to have been completed, as the mansion was evidently intended to form a square with a central court. Especially noteworthy are the square turrets to the lower part of the building, which are happily contrasted with the slender angle turrets of the tower. This tower dates back before Seton's time, an was probably one of those simple square towers which give us in these peaceful days a very good idea of th different state of things prevalent in Scotland in th fifteenth century. Protection was essential to the Scottish baron, and he sought it in height and narrowness; but in the seventeenth century increasing prosperity and public safety led to an expansion in architectural development which prompted him to make ornamental additions to his ancestral halls. This phase is admirably illustrated in Pinkie House.

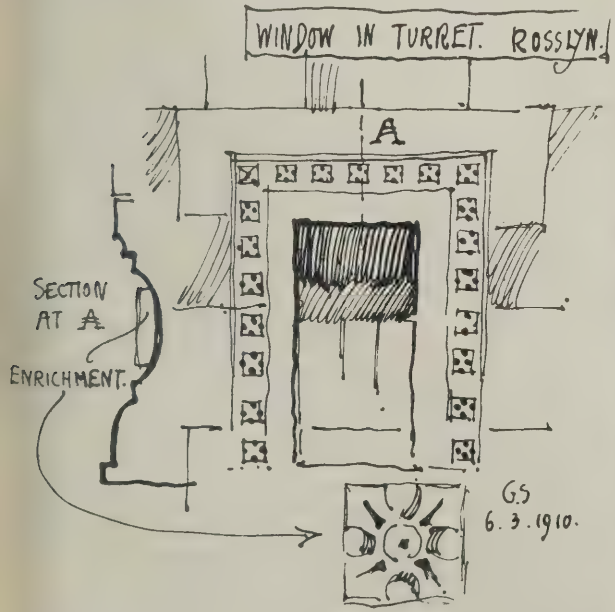

THE OLD CHURCH
NORTH BERWICK.
GORDON. SANDERSON.

*North Berwick.*—At North Berwick the municipal buildings again claim one's interest. The old parish church erected in the seventeenth century is now in ruins, the tower being practically all that remains. Within a little distance of North Berwick are several old castles. Saltcoats Castle shows well the high arched recess into which the drawbridge would be drawn up in time of siege.


IN THE COURTYARD
ROSSLYN CASTLE
G. SANDERSON.
6. 3. 1910.

Much of the building was used as a quarry some 100 years ago, and the demolition of it seems to have given some trouble, as the walls were said to be "seathed in steel." Fenton Tower was erected in 1575 by Sir John Carmichael, a Scottish worthy who was generally occupied in Border raids. The site is a well-chosen one, as from its walls the surrounding country can be surveyed for a considerable distance.


ORNAMENT AT A
TERMINAL MISSING.
DORMER AT ROSSLYN.
A
GORDON. SANDERSON.
MARCH 6. 1910.

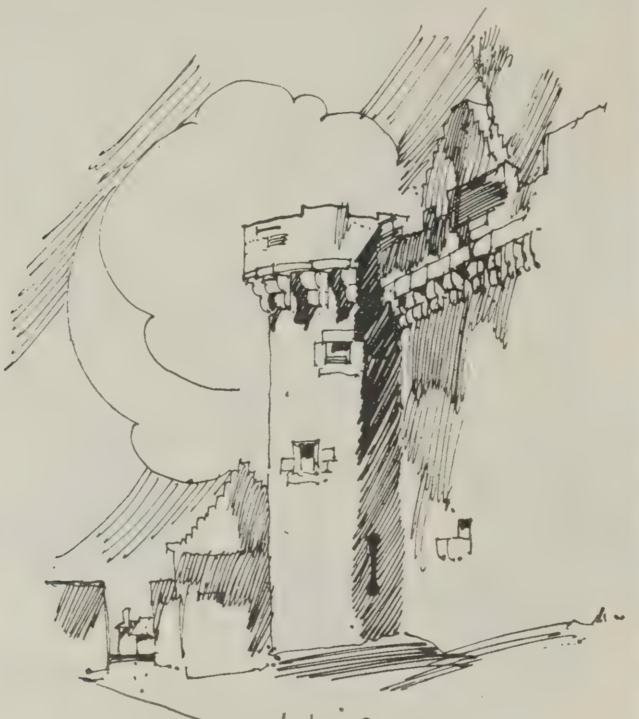


*Peffer Mill*, quite close to Edinburgh, is well worth a visit from anyone who, having little time to spare, would wish to see a typical old Scotch mansion-house. Its present surroundings do not do it credit, and it is no longer a country gentleman's residence, but its charm still remains and it is well worthy of study, and would be an excellent example from which to make measured drawings.

*Rosslyn Chapel.*—It must be admitted that, architecturally, Rosslyn Chapel is a little disappointing. The elaboration of its detail and the variety of its parts go far, it is true, to make this building full of interest, but its lack of symmetry and proportion give one a bad impression from the first. The builders of Rosslyn wished to make a big show for their money, and were also determined to put no ornament where it would not be seen. A fine building is undoubtedly the outcome of a lofty ideal, and buildings like Melrose Abbey, even where the darkened crypt is richly ornamented in the belief that with God there is neither light nor darkness, produce a more favourable impression on the beholder, and are undoubtedly finer examples of art. The Gothic architecture of Rosslyn cannot be assigned to any particular period. Mouldings and ornament of all kinds and types are to be found, and throughout the flying buttresses, pinnacles, tracery, and other members of this building an endless variety and profusion of detail predominate. Time and weather have somewhat subdued the superabundance of detail, and although Rosslyn Chapel cannot be put forward as a good example of Gothic architecture, it is well worth a visit.

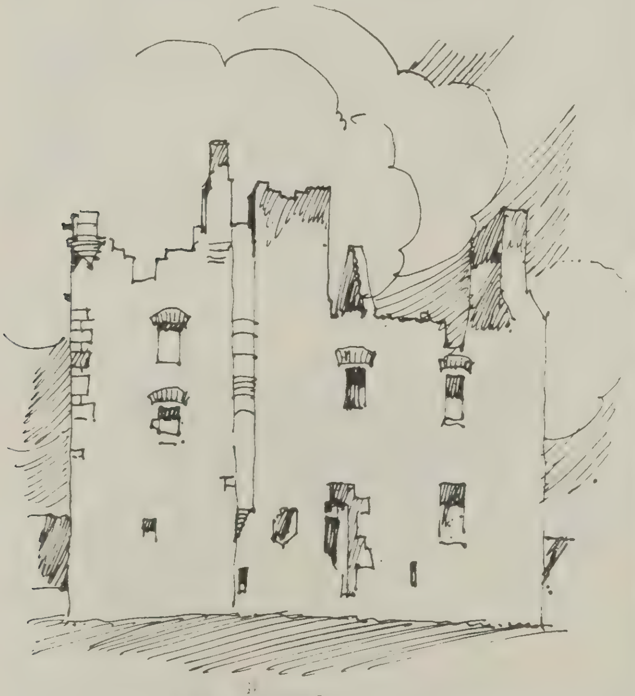
*Rosslyn Castle.*—Situated in a thickly-wooded glen, and accessible only from a bridge, Rosslyn Castle must have been admirably adapted for a siege, provided that plenty of the necessaries of life were to hand. Patrolling enemies would not notice it as they rode through the surrounding country, and no doubt this reason had much to do with the choice of this site, but it seems that the castle could have been easily beleaguered from the rising ground to the north.

*Craigmillar Castle.*—A more ideal site for a fortified building could not have been chosen than the ridge some three miles to the south of Edinburgh on which Craigmillar Castle stands. From its elevated position a good look-out could be kept, while its healthy surroundings have recommended it as a country retreat for Sovereigns desiring a change of air and rest after the gay Court life of Holyrood. As usual with Scotch castles, a square keep forms the centre and is surrounded by a high external wall, the angles of which terminate in circular bastions which command the intervening curtain wall. One of these bastions is shown in the sketch. These fine old Scotch castles, rising like watchful sentinels over the surrounding country, give Scotland a type of architecture which no other country can show. Built in days when every man's hand was against his neighbour, and when the ever-dreaded English hovered like a storm-cloud on the Border, their narrow, windowless keeps, crowned by corbelled turrets and crow-stepped gables, are the embodiment of strength and security.



CRAIGMILLAR CASTLE EDINBURGH.

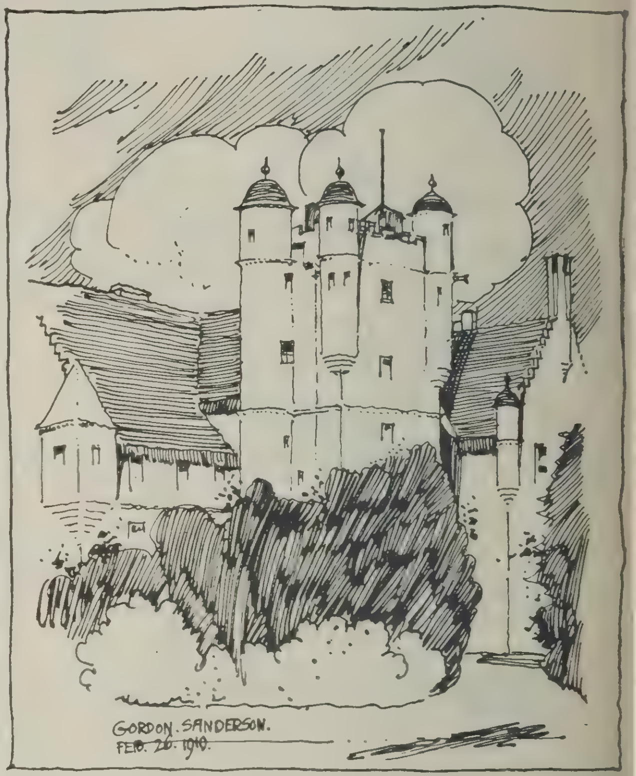
G. Sanderson Feb 1910.



FENTON TOWER.

G. SANDERSON

*Corstorphine Church.*—Founded in the fifteenth century by a Sir JOHN FORRESTER, this little church some three miles out of Edinburgh well repays a visit. It cannot be said that it is a good example of any particular style, and the pinnacles to the buttresses are heavy and out of keeping; but there is an air of unobtrusiveness and modesty about this little church which goes far to recommend it. The roof is of particular interest, being covered with old grey flagstone. The church was thoroughly and conscientiously restored in 1905. The roof may be compared to that at St. Mary's, Scarborough, Yorkshire.



GORDON. SANDERSON. FEB. 26. 1910.

## THE ARCHITECTURE OF BATH.

*(Concluded from last week.)*

AT the end of Brock Street stands the stately Crescent, with its ample and beautiful surroundings of lawn and park. The work was begun in 1767 and finished in about eight years' time. It was carried out by the younger Wood. The Crescent is elliptical on plan, and is 538 feet across its major axis. The central and two end houses are emphasised by the coupling of the Ionic columns. A plain basement storey supports a large Ionic order 2 feet 6 inches in diameter and 22 feet 6 inches high, running through two storeys over, with an entablature 5 feet high, the total height from pavement to parapet being 47 feet, or 5 feet higher than the Circus. Over this is an open balustrade, and originally the roof was covered with stone tiles, as were all the other houses in Bath. In the elevation I have shown the window openings with the original bars, and it is to be noticed that neither here nor in the Circus are there any mouldings round the openings. The face of the masonry between the columns is worked square and not to the sweep of the curve, as might be supposed; the effect of the flat face is, however, scarcely noticeable, and an enormous saving of labour is effected. The same principle is applied to the Circus, where it cannot be detected at all.

In the interior the increased height of the rooms produces a much colder and less comfortable appearance, and the window-heads are generally 2 feet below the ceilings, which causes the upper part of the room to be dark. About twenty-seven years before this plasterwork had begun to take the place of wood panelling upon the walls, the panels being generally divided by a cable moulding, and the oak staircases were fast disappearing, giving place to those of iron and stone.

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* A paper read before the Architectural Association on April 2 by Mr. Mowbray A. Green, A.R.I.B.A.

The ornament of the internal finishings and decorations became most elaborate, though the cornices occasionally degenerated into meaningless compositions. The ceilings are the most beautiful features, and vary from strictly geometrical patterns to a quite naturalesque treatment.

The fireplaces are often entirely of marble, statuary and Sienna being most frequently used.

About the year 1762 Milsom Street was begun, and soon became the principal shopping centre of the city and noted for many miles round. The ground floor, especially on the west side, had at first segmental bow windows. The central windows of the first floor have pedimented or other ornamental heads. The most important group of houses, and probably that first built, is on the east side, and was called Somersetshire Buildings. In this group of five houses the centre and two end ones are projected forward from the main line of street sufficiently to take a three-quarter column of the Corinthian order, and the middle house has, in addition, a segmental projection. In this house there is a magnificent ceiling, one of the finest in Bath.

Behind the houses just below this group stood the Octagon Chapel, built by T. Lightholder, or Lightoler, as he is styled on the engraved plans, which are copied from those in the British Museum. It was opened in 1767. The interior is planned as an octagon of about 53 feet in diameter, with four semi-circular recesses, the whole being contained within a square. The gallery was supported on eight stone Ionic columns, some 10 feet high, with finely-carved caps, and the cove above the octagon springs at about 29 feet from the floor, with a smaller cove, a drum and a semi-circular roof on the top, but the roof was not executed exactly as shown in the original section. The plaster decoration is in the Adams manner. In Old Bond Street near here there is another good ceiling.

The younger Wood's chief work was the Assembly Rooms, built in a dignified and simple style, and with the chimneys more carefully designed than in the earlier buildings of the century. They were begun on May 4, 1769, and finished in October, 1771, being built with a capital of seventy shares of the value of 300*l.* apiece on the Tontine principle, the building thus costing over 20,000*l.*, which was a large sum for that day. The plan is an admirable one, with an outer portico, an inner hall flanked by retiring-rooms on either side leading into an octagonal vestibule beyond, from which the large ball-room is entered on one side, the tea-room on the other, and the octagon-room on the third, all these rooms being *en suite*.

The ball-room, 104 feet long by 41 feet wide and 42 feet high, is divided into three parts. The substructure and the order over are hollow behind to allow of the raising and lowering of vertical sliding shutters for darkening the room in the daytime. The great cove is 11 feet 6 inches high, and from each of the five flat panels in the ceiling are hung magnificent cut-glass chandeliers. The three divisions of this room are too nearly alike to be satisfactory, and the order is dwarfed by the immense cove at the top.

The tea- or concert-room is 66 feet long, and of the same width and height as the ball-room, with an orchestral gallery at one end running the whole width of the room, where there is a fine ironwork grille of the period.

Alfred Street was built by Wood about the year 1768, and there is an interesting doorway here known as King Alfred's Doorway, from the bust of the monarch over, who is supposed to have surrounded the city of Bath with walls and gates. The ironwork shows the stand for the oil-lamp at the top and the extinguishers on either side, in which the link boys might "do out" their torches. The delicate treatment of the stone carving round the doorway shows quite a new departure from what we have seen up to the present.

Pulteney Bridge seems to have been the only work of the famous Robert Adam in Bath. It was erected about 1770 for the purpose of giving access from the city to the Bathwick Estate, which belonged to William Pulteney, and for the laying out of which Robert Adam got out many designs which are now in the Soane Museum. The present Pulteney Street is upon the very line laid down by him. It is probable that political reasons influenced Pulteney in favour of local talent, for he was at this time standing as a Member for Bath. The drawings before you are from Robert Adam's collection in the Soane Museum. Three segmental arches span the river, and are turned in single rings of stone. The upper part is occupied by a range of shops. The porticoes at the ends, long since taken down, must have formed a fine approach to the bridge. Fortunately, one of Malton's drawings remains to show us what it was like. There have been many alterations, both on the river and street side of this bridge.

About 1765 the Corporation had determined to build a new town hall and markets in High Street in place of Inigo Jones's hall, which stood in the middle of the Market Place, and amongst those who were asked to prepare plans were Lightoler, John Wood, Jones, the city surveyor, and Thomas Attwood. That Attwood had considerable capacity is shown by a building which he erected in 1772 as a prison in Grove Street, and in which he follows an earlier manner. The building must be judged of as a three-storey building only, for it was intended that a road should lead up to the central opening in the rusticated portion, which was designed not as a window opening, but as the main entrance to the building. Attwood was by trade a plumber, and amongst his other works he carried out the Paragon, Oxford Row, and the City Waterworks. There was considerable discussion about the plans for the Guildhall, but on February 11, 1768, the foundation-stone of the new building, which had been designed by him, was laid by William Chapman, Mayor. The cost was to be 6,500*l.* After this work went on slowly for six or seven years, because some of the tenants on the site were unwilling to give up their leases. In addition to this a question was raised as to the advisability of proceeding with the plans in hand. All this was, however, ended by the unhappy death of Attwood, who was crushed by falling timbers while some of the old houses on the site were being pulled down. Shortly afterwards Thomas Baldwin, who appears to have been a clerk in Attwood's office, offered a new plan. This was accepted, and the building was completed about 1778. Baldwin's work is strongly influenced by that of Robert Adam, but its detail is debased and it lacks the strength and vigour of that of the two Woods. Still, as a whole it is a distinctly fine building, on almost entirely new lines, and with excellent proportions. The basement is rusticated, with the central portion vermiculated as well, and the order over this part is a blending of the Ionic and Composite styles. A good feature is the recessing of the two outer windows. The figure of Justice at the top is of lead. The width of the façade is 85 feet.

Although the mouldings are attenuated and poor, they lend themselves satisfactorily to the internal treatment. Here there is much fine plasterwork, well preserved, and there is a very characteristic iron baluster in the staircase, which is of oak.

The banqueting-hall is treated with a low sub-plinth, 3 feet 5 inches high, and the engaged columns, which are of the Corinthian order and exhibit a Greek feeling in the capitals, are set on pedestals which stand forward from the rest of the wall. There are quarter columns in the four angles, and all the columns are widely spaced, with arched recesses and large plaster discs set alternately in the spaces over. Above is a cove which is ornamented in parts by a group of sunk lines, and the ornamentation in the large circular panels on the ceiling is very elaborate. The proportions of the wall treatment are exceptionally good.

In 1775 Wood rebuilt the hot bath at the end of Bath Street, and two years later published a small monograph on it. In 1779 he built Hardenhuish Church, near Chippenham. It is square on plan with an apse at the east end and a steeple at the west end. Neither the elder nor the younger Wood were, however, much employed in ecclesiastical work.

Reverting to the buildings in Bathwick, Argyle Street was in building in 1789, and here there still remain two good shop fronts executed in woodwork, and in one is a fine wooden fireplace, together with an original basket grate. Of the same character is one in Nelson Place East.

Laura Place was begun in 1788, and Pulteney Street about the same time. The former was by Baldwin, and on the latter both he and Eveleigh were engaged. The street is imposing in general effect, but poor in detail. It is 100 feet wide from house to house and 1,100 feet long, and is terminated at the end by the Sydney Hotel, which was built by Harcourt Masters in 1796, when the Sydney Gardens were also laid out by him.

Among other works by Eveleigh were Grosvenor Hotel and Bailbrook House. The former was built in 1790 and had immense gardens attached. It cost upwards of 10,000*l.*, but lay unfinished for many years.

The history of the Pump-room is too long to be given in detail. In 1785 Baldwin erected the northern colonnade at a cost of 130 guineas, and in May 1788 the foundation-stone of the new private, or King's baths, was laid by the Mayor, and the building begun by Baldwin. The original drawing, which shows the façade facing Stall Street, is done in line, with the masonry tinted in light stone colour and the shadows washed in with blue black. The scale is an arbitrary one, and the drawing is undated, but the name of T. Baldwin appears on the back.

It is not known who designed the west end of the Pump-room. William Reveley, a pupil of Sir William Chambers, gave drawings to the Corporation between 1791 and 1793, and the sum of 27*l*. 9*s*. 6*d*. was paid to him for these, but he probably did nothing further. It is more than likely that the general scheme is Baldwin's, but that after his dispute with the Corporation, John Palmer finished it, and so says a guide of 1823. Palmer almost certainly added the portico on the north side.

The interior of the Pump-room has a Corinthian order with segmental recesses at each end and elliptical lights at the top of the room between the columns. This room would have shown a better proportion had the columns been less heavy and set upon a sub-plinth.

Under the great scheme for rebuilding this portion of the city by the Act of 1789 Bath Street, Cheap Street, and Union Street were all built by Baldwin. Of these Bath Street is the most interesting piece of work, with its Ionic colonnades forming a covered walk from one end of the street to the other.

The Cross Bath at the west end is also by him.

Among some of the latest buildings of the century were Camden Crescent, built on an elevated piece of ground overlooking the London Road, and a great deal of work on the northern slopes above the Royal Crescent, where John Palmer built St. James's Square, Lansdown Crescent, and All Saints Chapel. He also designed the façade of Kensington Chapel on the London Road. Some years earlier he had, together with his partner Jelly, rebuilt St. James's Church

The styles of the eighteenth century may be divided into three groups—that of the first twenty-five years, when the houses had gabled roofs and façades with large sash windows surrounded by bolection mouldings, and when the interiors were panelled with wood and the rooms small and comfortable ; the next fifty years, when the work was modelled on the Classic Palladian manner, with a rusticated basement, a two-storeyed order, a crowning cornice and parapet, and a Mansard or curb roof over, while the interior became spacious and dignified, and plasterwork was brought into general use ; and the last twenty-five years, when the free manner of Robert Adam came into vogue, and the strong methods of the earlier times gave way to detailed and abundant decoration.

Mr. Mervyn Macartney, proposing a vote of thanks to the author for his paper, said one point he would like to ask about was with reference to the original lay-out of Bath. Had the lecturer a contour map by any chance ?

Mr. Mowbray Green : No, I have not one here.

Mr. Macartney, continuing, said one of the most interesting points to him was how Wood took advantage of the shape of the ground on which Bath was placed. Wood started with Queen Square, and then he went straight along the adjoining tongue of land until he came to a fairly level site. He planned his work according to the contour of the ground, a precedent which should be borne in mind when we were considering modern schemes for town-planning. If the improvements Wood carried out in Bath were the architect's own speculation, he thought the lecturer might be able to give them some particulars as to their origin. He wished also to ask Mr. Green about the old buildings near the Cross Baths ; he thought they were older than those shown on the screen.

Mr. Green said he would have liked to have shown some of the old buildings built about 1690 and 1710 ; they were older than Wood's work, but he did not possess illustrations of them. He did not know by whom they were built, and it was difficult to say that an architect was responsible for them.

Mr. C. H. B. Quennell seconded the vote of thanks, and alluded to the late Mr. Brydon, who was, he said, wholly in sympathy with the work of the eighteenth century in Bath. The city was interesting to the speaker because it represented the first examples of houses built in terraces and blocks, and it always recalled to him Sheridan's plays. As houses to live in, he thought the buildings in Bath were about as uncomfortable as one could find, and as models exhibited to students of architecture they exposed what should be seriously and sincerely avoided, and he hoped the A.A. student would not design Wood houses.

Mr. H. A. Hall agreed with the last speaker, and said the buildings in Bath seemed suitable only as a background to the life and fashions of Georgian days. The city was a gloomy one, and seemed to need such accessories as Sedan chairs and men and women dressed in colours. As a retrospect it was very charming, as a reality he did not appreciate it.

The President, in putting the vote of thanks to the meeting, said that although he did not think the architecture of Bath merited serious attention, yet they were grateful to Mr. Green for having given them such an interesting paper, and he felt during the reading of it that if they had men like the author who would study as carefully the architecture of other towns what a wonderful collection of architectural and archæological knowledge would be gained for them.

Mr. Green, in his reply, said Wood was a genius in so far as he represents in his houses the manners of the period. He failed to see the dull monotony of those houses. He had lived in Bath for twenty-five years, and he appreciated the city more and more every year. Nor did he agree that the houses were impossible or hopeless to live in, for he knew many which had most cheerful rooms.

The President moved the adjournment of the meeting until Tuesday, May 31 (5.30 p.m.), to receive the report of the scrutineers on the result of the voting on the proposed amendment to the constitution and by-laws of the Association.

## OUR CONTEMPORARIES FROM OVER-SEAS.

"THE AMERICAN ARCHITECT" (New York) has apparently determined for once to give us examples of how bad modern American architecture can be on occasion. Bethany Memorial Church, New York, is a horror, but to show that it is not unique we have also Van Nest Chapel and a shop building on Fulton Street, both in New York, and equally dreadful.

*La Construction Moderne* (Paris) shows an example of the infelicity, as we think, of modern French country house design in a villa at Bois-le-Roi, of which M. Cuinat is the architect.

*Het Huis* (Amsterdam) fills most of its current number with a historical and descriptive account, well illustrated, of St. Walburg's Church at Zutphen. Some details of a modern house at Dordrecht are interesting.

*The Architectural Record* (New York) gives an account of the work of Messrs. N. Le Brun & Sons, the architects of the Metropolitan Life Insurance Building, New York, the cathedral of SS. Peter and Paul, Philadelphia, and many other buildings, varied in the eclecticism of their style as in their purpose. No. 1 East 75th Street or Fifth Avenue Mansion, by Jas. Gamble Rogers, dignified and sedate externally, contains a plethora of luxurious and costly detail internally. "The Wild Men of Paris" is a sketch of the latest revolt amongst French painters, who want to do something as different as possible from anything that has been done before by acknowledged artists. The results so far are ludicrous, but so at one time was pre-Raphaelitism.

*The Architectural Review* (New York) has a description, well illustrated, of a charming "unknown Maryland manor," Montebello, built at the close of the eighteenth century. Illustrations, including geometrical drawings and details, are given of one of Messrs. Carrere & Hastings's buildings, the Carnegie Institution of Washington ; also of a relief station of the Boston City Hospital, by Mr. Edward Percy Dana.

*Berliner Architekturvelt* (Berlin) gives this month some examples of buildings for the housing of several official bureaucratic departments, such as the City Gas Department of Berlin and Land-banks at Posen and Brandenburg, also a German "Rowton House," "Ledigenheim" at Charlottenburg, and some more of the designs submitted in the competition for the extension of A. Wertheim's stores.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### Action by the Society of Architects.

Sir,—With regard to the recent unsuccessful application of this Society for an injunction to prevent the unauthorised use of the distinctive initials "M.S.A.," referred to in your columns at the time, will you kindly allow me to make known through the same medium the fact that my Council has decided to appeal against the decision then given.—Yours faithfully,

C. McArthur Butler, Secretary,
The Society of Architects.

May 17, 1910.

## ILLUSTRATIONS.

### RESIDENCE AT WARWICK.—COTTAGE ERECTED AT MELDRETH.—COTTAGE ERECTED AT MILFORD-ON-SEA.

OUR plates this week are illustrative of the work of Mr. P. Morley Horder, and show houses built now some time ago.

# MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

## IX.—INSULATION (*continued*).

FLOORS which are to stand rough usage or to carry heavy weights must be of stronger construction than the walls. This extra strength will in most cases be quite sufficiently obtained by using, say, 9-inch by 3-inch bearers, instead of making these 6 inches by 2 inches, like the studding round the walls. The sheeting would at the same time be stiffened up by putting in strong T. and G. flooring boards in place of the ordinary matching. This method has the double advantage of giving the necessary increased strength and simultaneously bringing up the insulation efficiency at the point where it is most required.

The construction, assuming an existing floor of good concrete, would now be as follows:—First, battens about 3 inches by 1 inch would be laid on the rough floor. On these would be fixed a layer of 1 inch or $1\frac{1}{4}$-inch T. and G. matching, and on top of the matching, at the same centres as the battens, would be laid the bearers. The filling material would then be packed in between these, and they would finally be covered in with black paper and $1\frac{1}{2}$-inch T. and G. flooring, instead of, as on the walls, two layers of $\frac{3}{4}$-inch T. G. and V. matching. Some authorities recommend using ordinary flooring boards instead of the tongued and grooved, and caulking the joints, as in a ship's deck, with oakum and pitch. Very little extra advantage is gained, however, by so doing, and the cost of building is considerably increased.

An extra strong construction is that which was adopted in the large stores at St. Katharine's Dock, London. Here the concrete floor of the vault in which the stores are built was covered first with $1\frac{1}{4}$-inch rough boards. On these were laid transversely $4\frac{1}{2}$-inch by 3-inch bearers at 21-inch centres, between which well-dried wood charcoal was packed as filling. Finally, $2\frac{1}{2}$-inch tongued and grooved flooring was nailed to the bearers to ensure great stiffness. In the writer's opinion the thickness of this insulation is inadequate, but, owing to the heavy flooring boards and broad joists great strength is obtained, and heavy loads may be handled with impunity.

In up-to-date meat stores all trouble about great floor strength is superfluous, as the handling of the carcases, sides and quarters is effected entirely by overhead runways, switches and running wheel hooks. The strength of the ceiling is then of more importance, and the construction in this case, with the arrangement of the tracking, will be fully described in its place.

There is yet another kind of floor, which is used where liquids are liable to be spilt inside the store, or where frequent cleansing must be effected. Timber is unsuitable for this purpose, as the continued dampness would set up decomposition, and we must therefore resort to concrete. Concrete by itself is to a certain extent porous. Hence a layer of pitch, bitumen, or asphalte is set underneath, and the insulating efficiency is brought up to the proper standard by a substantial thickness of engine ashes. This arrangement is illustrated in fig. 26, where the hollow dwarf wall, which, with this type of construction, should always be carried round the sides, is also shown. From the top of the dwarf wall upwards insulation is carried out in the ordinary way, but as the timber work in connection therewith is well clear of the parts where splashing, &c., takes place, no danger of dampness need be feared. For the best results the dwarf walls should be built of Staffordshire bricks, and all joints made of good cement instead of mortar.

Outer Walls.—The majority of existing cold stores are built of brick, the insulation being affixed as an inside lining, although latterly, in buildings of any size, reinforced concrete has come more into favour. But, in the writer's opinion, the best outer wall possible is that made from hollow concrete blocks, reinforced at intervals by iron stanchions to carry the wall plate. Walls of this type are not only excellent aids to the insulation proper, owing to the dead air-spaces inside the concrete, but are also far less expensive than might be thought. In fact, a building of this type is considerably cheaper than one built of ordinary bricks. The finished appearance is decidedly handsome, and the whole effect is of a solid well-built structure.

Whatever form of outer wall be adopted, it is always an improvement to paint it both inside and out. Both coatings should be air-proof, and that on the outside should in addition be capable of resisting the action of inclement weather. For this purpose whitewash will be found to be cheap and suitable, and, according to Mr. Williams, can be rendered weather-proof by mixing 50 lbs. of salt to every 40 gallons of the liquid. Another formula, due to the same authority, is to mix six parts of lime in warm water to the required strength, add three parts of salt when solution has taken place, and, just before use, mix in one pint of Portland cement. For the inside coating bitumastic tar or paint does admirably.

Partitions.—The divisions between the neighbouring cold stores, provided the difference in temperature is not very great, need not be so thickly insulated as the walls. In most cases four inches of filling material, with corresponding studding, and $\frac{3}{4}$-inch T. G. and V. matching on either side, will be found to be ample.

Where there are two stores one above the other the same rule applies theoretically, but in practice the ceiling joists must be sufficiently deep for the necessary strength. In some stores these will be 6 inches by 3 inches, in others 9 inches by 2 inches, or even 9 inches by 3 inches, depending, of course, on the load, span and distribution. In any case only four inches of filling need be used, the remainder of the ceiling depth being left as an air-space. The filling is simply laid in, and no trouble need be taken to sheet it down.

General Arrangement.—In arranging cold stores, there are several points which deserve attention. It is important, for instance, that the shape of the whole insulated space should approximate to a perfect cube, as the radiating surface for a given volume is then at its minimum. Unfortunately, this is an ideal which in practice is seldom attained. With very small stores there is, of course, no difficulty, but in larger buildings, unless there are two or more storeys, the height necessary would be impracticable. The next best arrangement is to make the plan view of the insulated rooms a perfect square, and this can often quite easily be done. The height can then be adjusted to the particular requirements in view.

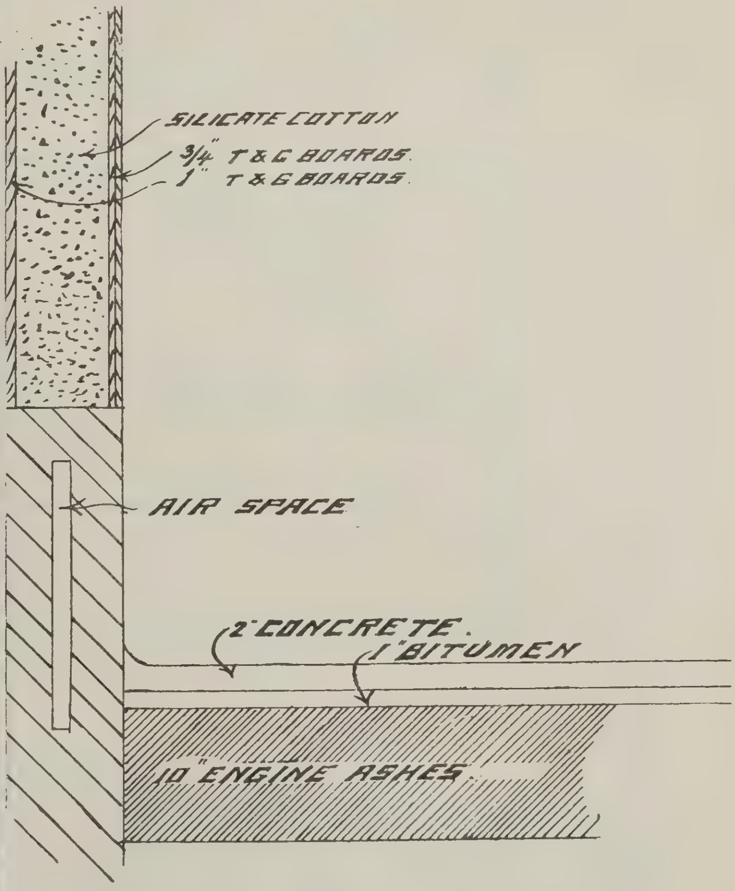


Fig. 26.

In many cases lately the cooling machinery has been erected in a separate building. This is an excellent idea, and makes an arrangement much superior to that ordinarily adopted. Should it be impossible, however, care should be taken that the machinery is always to the south and the cold rooms to the north of the building (if the plant, that is to say, is located in the northern hemisphere). Similarly, if the machinery is in a separate building, the rooms, where the lowest temperature is to be maintained, should always be situated to the northwards, and the southerly aspect given to those where higher temperatures will prevail.

Our ideal, then, of a cold store is a thickly insulated cube, divided into compartments by thinner partitions and floors, and having near it a smaller building containing the refrigerating plant. Usually this theoretically perfect arrangement is unattainable, chiefly owing to difficulties connected with the site; but it can always be, and has frequently been, closely approximated to by careful designers.

Air Locks.—The space inside the cube or square should not be entirely devoted to rooms. Part of it should be used to form a corridor or air lock. The idea of this is to save the great leakage of cold air which is caused by opening a door direct from the store to the outer air. Instead, the door from the store is made to open into an intermediate space or lock, and, being closed, another door is then opened from the lock to the atmosphere. In this way leakage is much reduced.

This arrangement is shown in figs. 27 and 28. Fig. 27 shows two cold rooms, total capacity 10,000 cubic feet, which were designed to suit a curious circular building already in existence. The plan view of the rooms, as will be seen, bears very little resemblance to a square, and their general shape bears still less to a cube. The plan, however, has been brought as near to the former as the design of the existing building would permit.

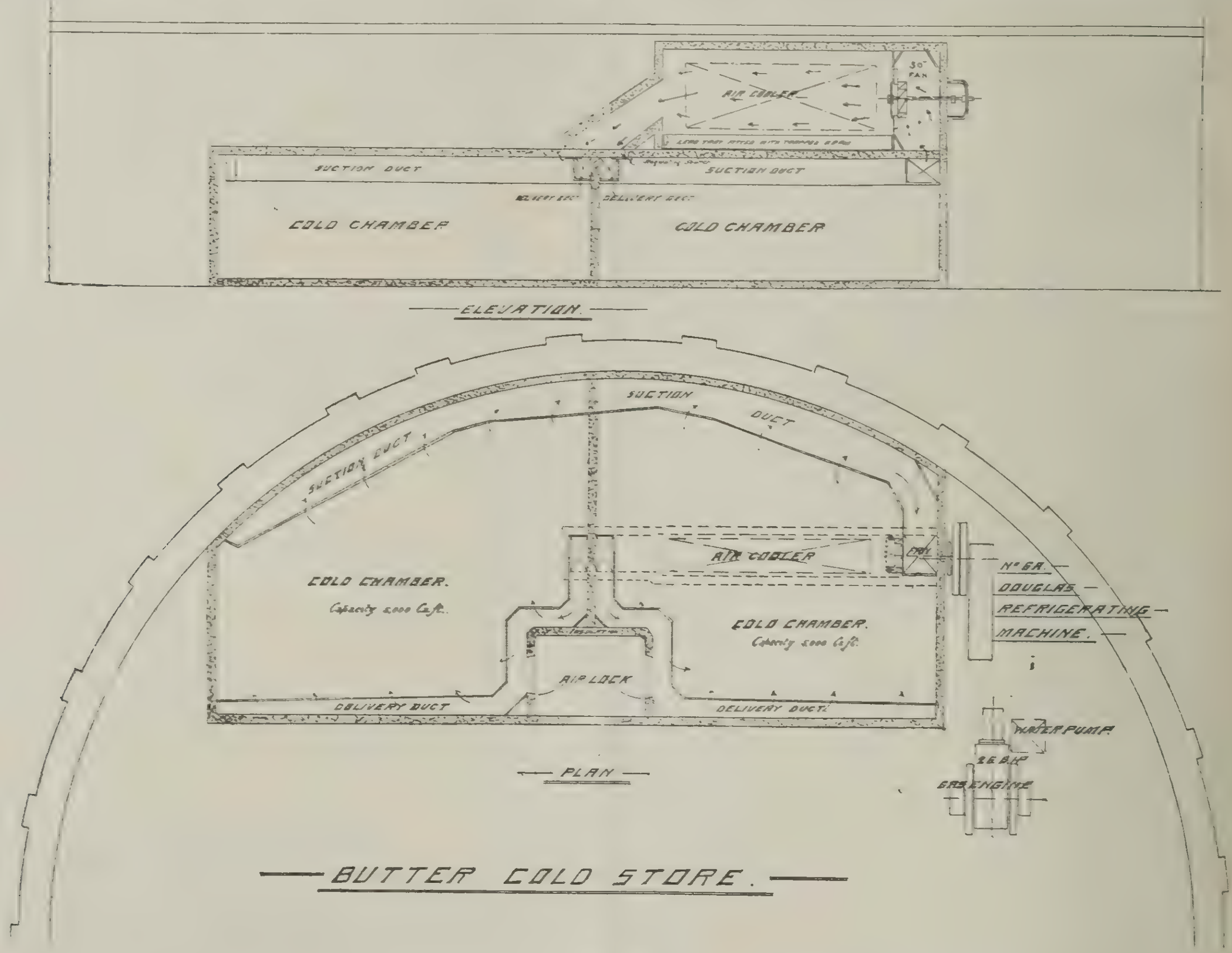


Fig. 27.

The air lock, with its three doors, is seen in front. One door is provided for each room and one at the entrance to the lock, and, from inspection, the method of manipulation when entering a given chamber will easily be followed. A man bringing in goods first lets himself into the air lock, then shuts the outer door behind him, and finally opens the door leading to the room in which he must deposit the goods. On coming out his actions would be exactly reversed.

The cooling in this case is effected by a separate air-cooler on the direct expansion principle, which is placed in a well insulated chamber on the roof of the stores. Insulated passages communicate from it to each room, where they are continued as cased-in ducts, formed of T. and G. boarding nailed on suitable runners. The air is circulated through the ducts and passages by a fan, and the amount which enters or leaves a room at a given spot is regulated by teak slides. The air cooler itself is connected directly to the horizontal compressor seen on the right-hand side, which is driven by a gas engine. Its condenser, of the atmospheric type, is not shown.

In fig. 28 the air lock is extended to serve four separate rooms, and might more properly be termed a corridor. It has now five doors. Cooling here is effected by direct expansion air-coolers in the left-hand rooms and by direct expansion pipes in those to the right. In the first case the coolers are partitioned off, and air is distributed to all parts of the rooms by ducts, through which it is blown by fans. Connection in all cases is made direct to the horizontal compressor seen on the left, and each room, by means of suitable valves in the piping, can be independently controlled. A gas engine drives the fans and the compressor, and for the latter a condenser of the submerged variety is provided.

Doors.—The most important fittings in a cold store are the doors. It is very essential that these should be carefully constructed, and that at the same time, when closed, they should be absolutely air-tight. No difficulty should be experienced in either opening or closing, as both operations must be quickly done, and the door, although heavy, must always swing freely on its hinges.

The door is heavy because it is always made to the same thickness as the walls, and if these are insulated with silicate cotton its weight on the hinges will average, for ordinary sizes, some 2½ cwt. To meet the extra stresses, the hinges must always be of very heavy construction and have spherical joints. In extreme cases, if the door, for example, is four feet wide in the clear, part of the weight should be taken on a caster, moving over a metal quadrant, which is fixed to the floor. This will considerably ease the great stress on the sockets of the hinges.

To ensure tightness when closed the door is splayed, more bevel being given at the side opposite the hinges to allow of clearance when the door is swinging. Felt is also nailed round all the edges to form a joint, and pressure is applied by specially designed lever fasteners. Many forms of these are on the market, but perhaps the most useful are those shown in figs. 29 and 30. The construction cannot clearly be seen from the illustrations, but is really extremely compact. The fastener proper is simply made to slide over a wedge, and as it nears the raised part of the said wedge forces the door hard against the framing. Immense force is obtained owing to the shape of the wedge, and no fear need be entertained of air escaping.

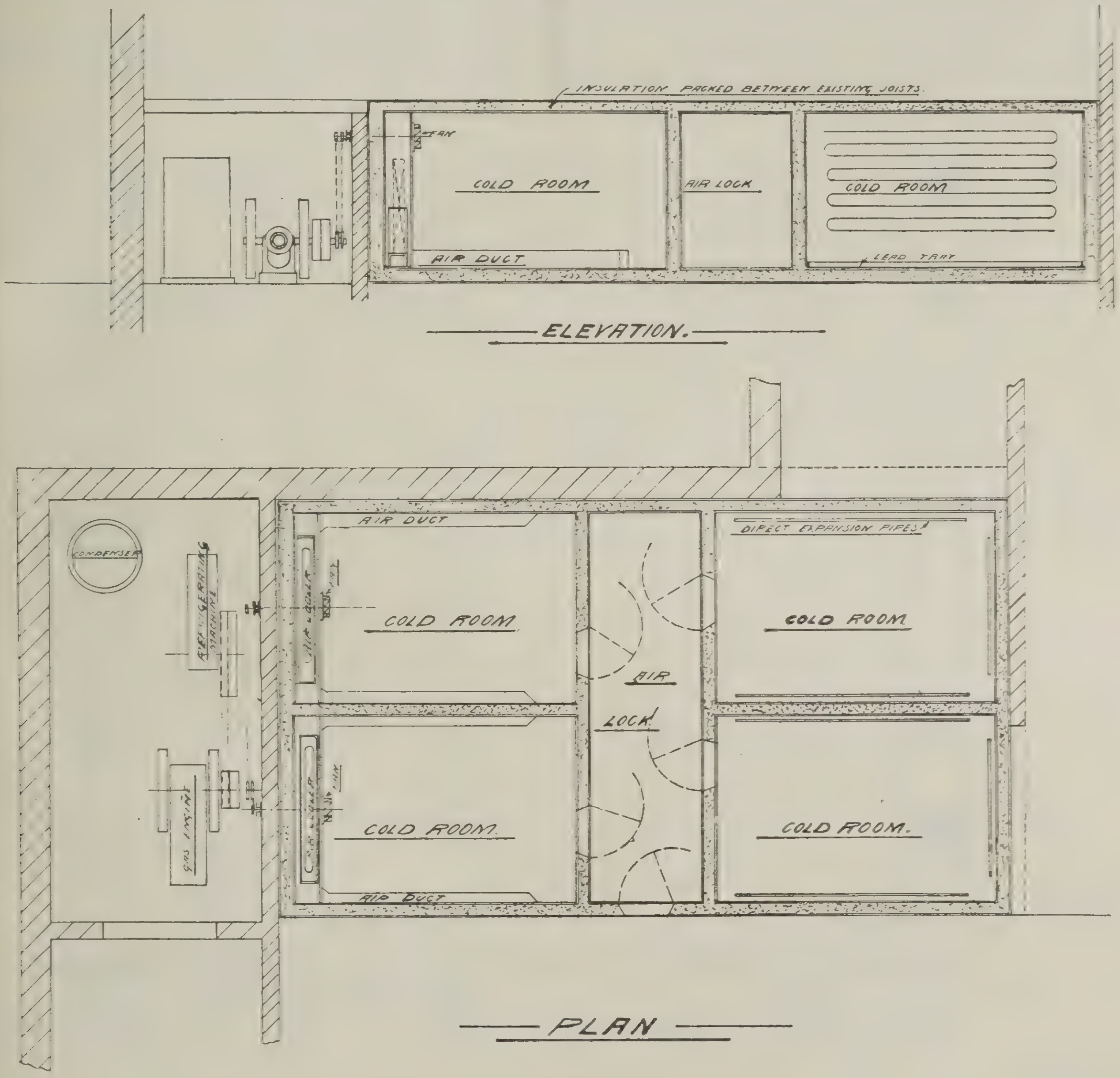
Fig. 29 shows a double door, 7 feet wide in the clear, such as has to be used if goods must be wheeled into the stores on trucks or vans. This particular door was designed for a bacon factory. Special note should be taken of the arrangement adopted in obtaining the correct bevel on each half. By closing first one of the halves and then the other three air-tight joints are made.

It is very often necessary to take a track bar right into the chill room. This is found in a large number of meat stores, in all bacon factories, and in all abattoirs. Wheel hooks run on the bar, and from these are hung the carcases, sides, or quarters, as the case may be. Naturally complications must always ensue when we come to a door, but many devices have been invented to surmount the difficulties. One of the best of these is shown above the door in fig. 30. The door opens below the bar, and two slides are then shot back, one on either side of the runway. Easy admission is thus obtained. When all the loaded wheel hooks have entered the door is shut, and the closing of the slides checks most of the leakage of air. At the same time there is bound to be a certain amount of loss, as there can be no insulation immediately round the bar.

The problem of the loss due to exit and entry of cold stores has always been quite a serious one. There is no doubt that the leakage of heat into the rooms where there is much traffic is very considerable, and well worth saving if possible. One simple way of partially effecting this, in small stores, is to build them in a basement, which can quite conveniently be done in the case of a shop, for instance. Entry is then obtained through a trap-door in the roof, and only the heated air at the top is allowed to escape. This arrangement, however, is unsuitable for large stores, as the handling of the goods is rendered by far too complicated. We must then devise other means.

Sometimes door checks or buffers, such as those made by Messrs. Nettlefold or by Messrs. Newman, have been tried; but as a general rule, owing to the very great weight of the insulated door, have been found to be unsuitable. Springs can be used, however, by fixing inside the door proper a pair of light flaps. These are hinged to a simple frame, which carries them at about four inches from the inside of the door, and the hinges are of the spring variety, many of which are on the market. The flaps then always tend to come to the closed condition, no matter in which direction they are opened, and a man with, say, a quarter of beef on his shoulder simply pushes through them.

This scheme is effective and reduces the loss considerably, but is far from perfect, as the flaps cannot be insulated. The nearest approach to perfection we can obtain is the arrangement which involves the greatest trouble in practice—namely, the air lock. There is no doubt that by its use a great saving is effected, where many deposits and removals of goods are frequently made. At the same time, as the traffic through the lock increases so does the inconvenience of working it.



ELEVATION.

PLAN

Fig. 28.

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The Bournemouth Town Council have decided on the erection of a central library on the vacant portion of the site at Lansdowne purchased in connection with the scheme for the Central Art and Technical School. The expenditure is estimated at 7,000*l*. The borough surveyor has prepared a sketch, plans and estimates for the construction of the continuation of the Undercliff drive to Boscombe Pier.

## TOWN PLANNING IN GREATER LONDON.*

For the London County Council area the London County Council is the statutory authority, as will be seen from the following part of Sub-section (3) of Section 55 of the Act:—

"Provided that, except with the consent of the London County Council, no other local authority shall, as respects any land in the County of London, prepare or be responsible for enforcing the observance of a town planning scheme under this part of this Act, or for the execution of any works which under the scheme or this part of this Act are to be executed by a local authority."

For those areas beyond the London County Council area the Councils of any borough or urban or rural district are the statutory authorities.

For the area comprised within a fifteen mile radius of Charing Cross the town planning authorities are therefore the London County Council and the various borough, urban district and rural district councils named in the notice convening the conference.

With the permission of the Local Government Board a local authority may prepare a town plan dealing not only with the land within its area, but beyond such area and within the area of another local authority.

Town planning in Greater London is so obviously a matter for joint action that the following paragraph of Sub-section (3) of Section 55 may be given in full:—

"Where land included in a town planning scheme is in the area of more than one local authority, or is in the area of a local authority by whom the scheme was not prepared, the responsible authority may be one of those local authorities, or for certain purposes of the scheme one local authority, and for certain purposes another local authority, or a joint body constituted specially for the purpose by the scheme, and all necessary provisions may be made by the scheme for constituting the joint body and giving them the necessary powers and duties."

A joint body undertaking the preparation of a plan for Greater London may thus be composed of all the local authorities possessing statutory town planning powers in the area dealt with in the plan.

Town plans may be made by town planning authorities as defined above, as respects any land which appears likely to be used for building purposes within their areas.

In the House of Commons Committee stage attention was drawn to the fact that in the event of a narrow interpretation being given to the words "in course of development," or to the words "likely to be used for building purposes," the town planning scheme would be limited to areas of land actually "ripe for building," and the greater part of the value of a town planning scheme would thus be lost.

The President of the Local Government Board urged, in reply, that the words used instead of limiting the scope of a scheme would have the opposite effect, especially as the Local Government Board take power to authorise the preparation of such a scheme with reference to any land within or in the neighbourhood of the area of a local authority.

It may be added that in Germany the practical inter-

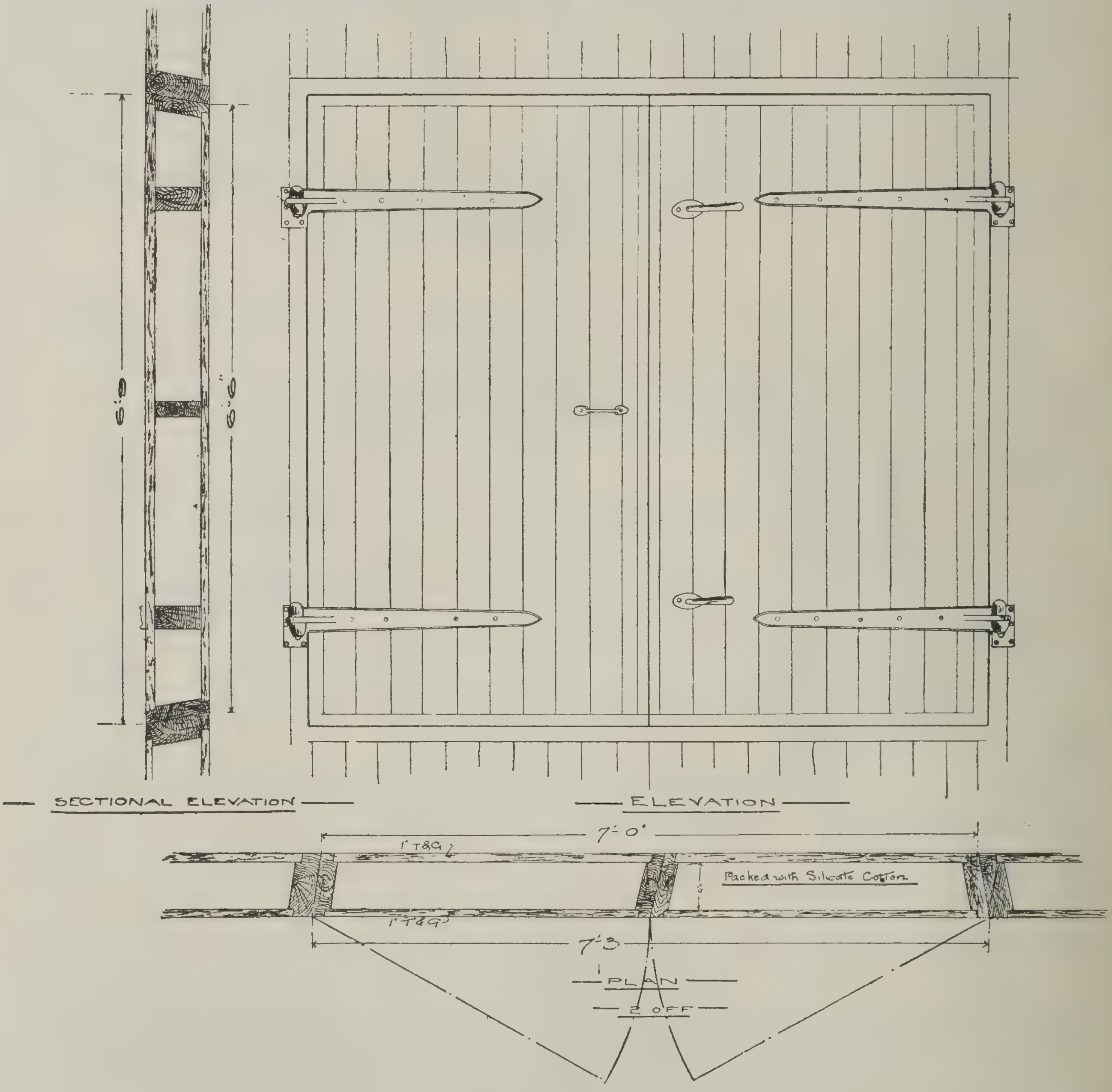

Fig. 29. (See p. 322.)

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* A Memorandum on the scope and character of the town planning powers of the Housing and Town Planning Act. Prepared by Henry R. Aldridge, secretary, National Housing and Town Planning Council.

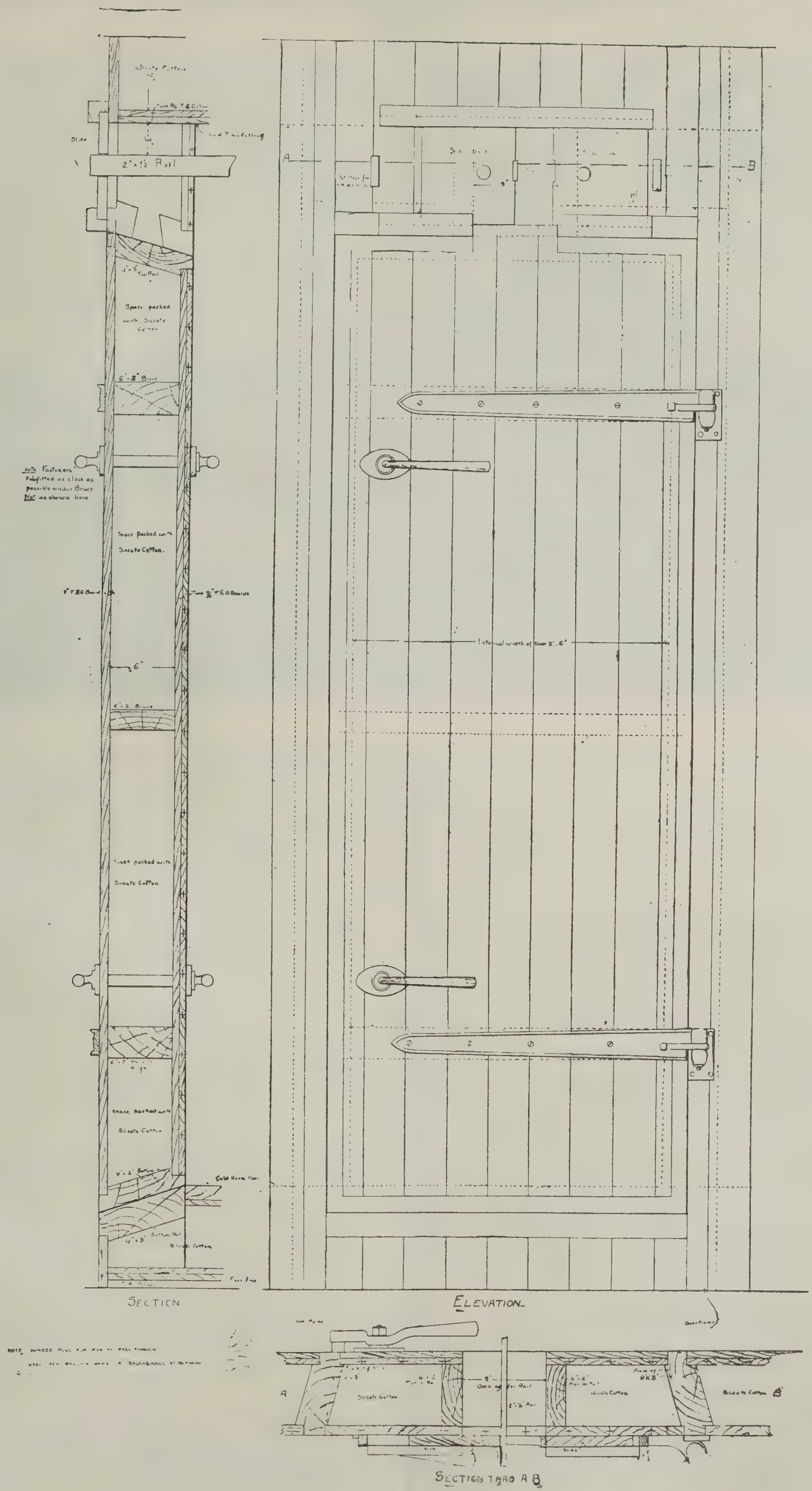
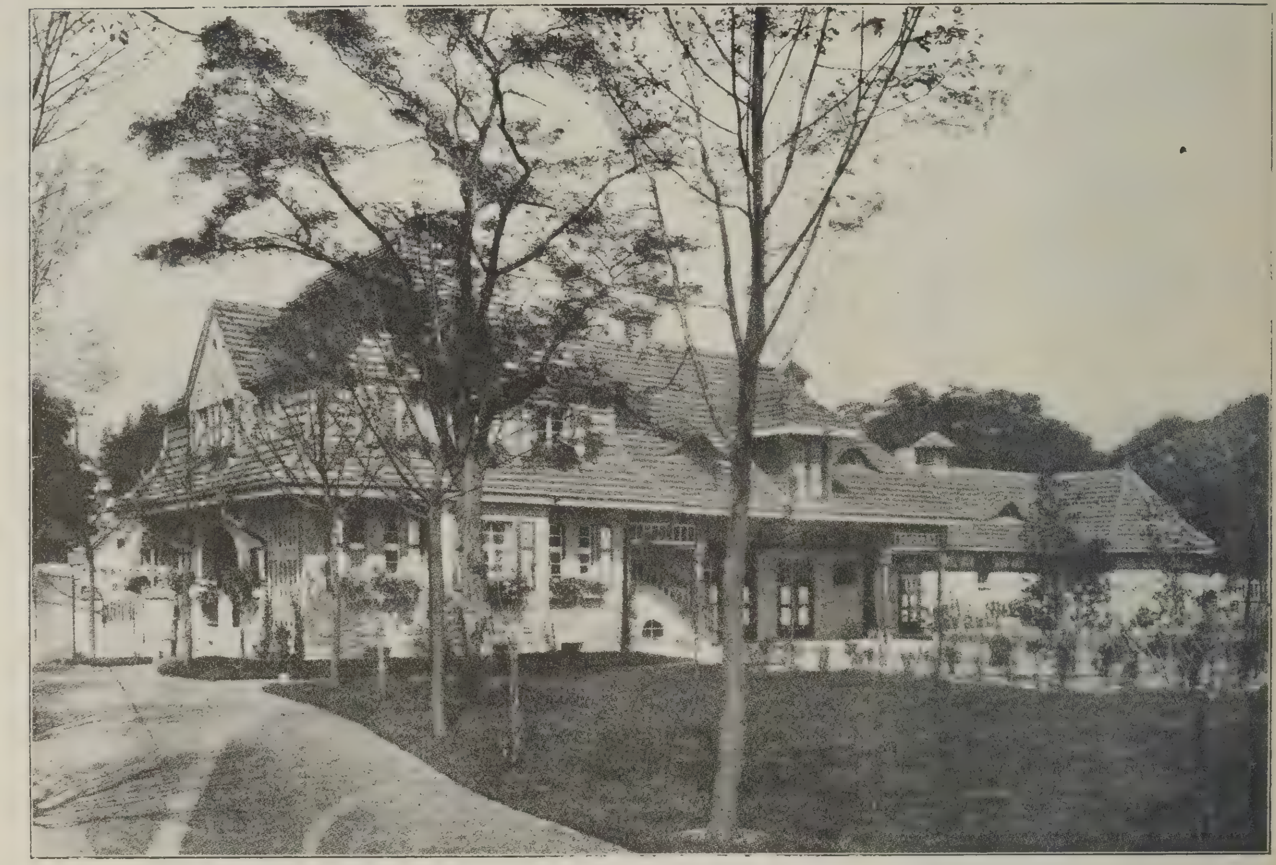

Silicate Cotton
Slide
2" x 1½ Rail
Top Rail
Space packed with Silicate Cotton
6" x 8" Brace
Fasteners to be fitted as close as possible under Brace Not as shown here
Space packed with Silicate Cotton.
Two ⅞" T & G Boards
6"
6" x 8" Brace
Space packed with Silicate Cotton
Space packed with Silicate Cotton
4" x 3" Bottom Rail
Silicate Cotton
SECTION
A
B
Internal width of Door 2' 6"
ELEVATION
Door Frame
8"
Opening for Rail
Silicate Cotton
9x3"
Slide
A
B
SECTION THRO A B

FIG. 30 (See p 324.)

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Berliner Architekturwelt.*

STABLES, &c., OF THE VILLA LEMM.—Herr MAX WERNER, Architect.

pretation of the Town Planning Act, 1875, in regard to the scope of a town planning scheme, has been to regard land likely to be used for housing and similar purposes during the next thirty years as coming within the scope of a scheme.

The following definition of "land likely to be used for building purposes" is given in the Act (Section 54, Subsection 7):—

"The expression 'land likely to be used for building purposes' shall include any land likely to be used as or for the purpose of providing open spaces, roads, streets, parks, pleasure or recreation grounds, or for the purpose of executing any work upon or under the land incidental to a town planning scheme, whether in the nature of a building work or not, and the decision of the Local Government Board, whether land is likely to be used for building purposes or not, shall be final."

The procedure to be followed in the preparation of such town plans has been thus outlined by the President of the Local Government Board, Mr. John Burns:—

(*a*) The placing by a local authority of a prima-facie case for the preparation of a town plan before the Local Government Board.

(*b*) The holding of a preliminary inquiry concerning the need for action.

(*c*) The authorisation of the local authority to prepare a detailed plan; the issue of provisions relating to co-operation on the part of the local authority with the owners and other persons interested in the land, and the formation if necessary of a joint body of local authorities where the land to be planned is in the area of more than one local authority.

(*d*) The holding of a local and public inquiry to fully consider the plan when prepared; and

(*e*) The formal authorisation and publication of the plan which will then be in operation until superseded by another plan.

The Local Government Board are about to issue, under Section 56 of the Act, regulations governing the procedure to be adopted with respect to applications for authority to prepare or adopt a town planning scheme.

When a town plan has been prepared and adopted and all the various stages have been passed through, the definite lines of ordered growth should have been clearly laid down for the area which has been made the subject of the town plan.

These lines of growth include:—

(1) The limitation of the number of houses per acre.

Speaking in the House of Lords on behalf of the Government, Earl Crewe described this power to restrict the number of houses per acre as one of great value, and the President of the Local Government Board has also stated that this power is one of the most vital of the new powers contained in the Act.

This restriction is not to be made the subject of compensation by the local authority, for under Section 59 (Sub-section 2) it is provided that:—

"Property shall not be deemed injuriously affected by reason of any provisions inserted in a town planning scheme, which, with a view to securing the amenity of the area included in the scheme, or any part thereof, prescribe the space about buildings, or limit the number of buildings to be erected or prescribe the height or character of buildings, and which the Local Government Board, having regard to the nature and situation of the land affected by the provisions, consider reasonable for the purpose."

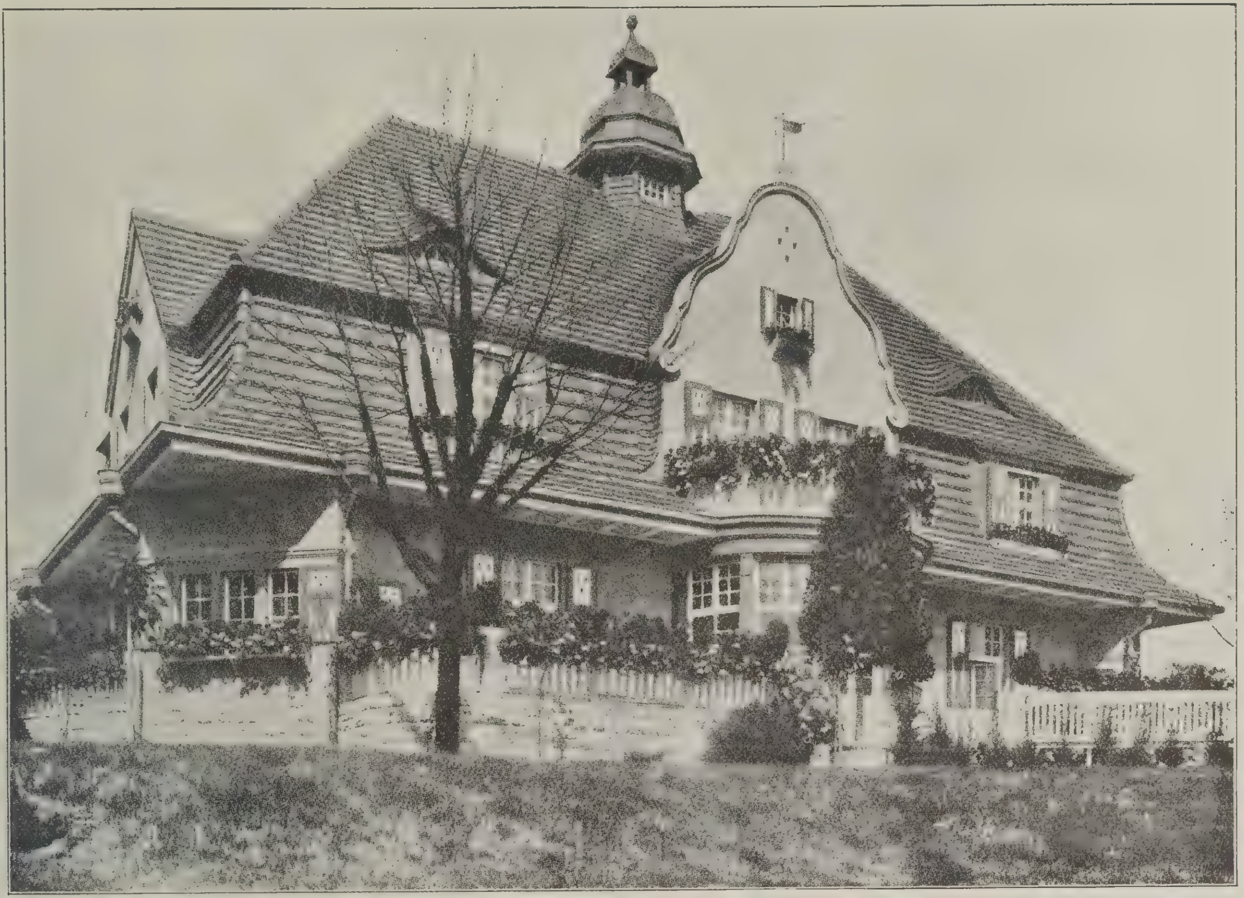
(2) The planning of the main arteries and subsidiary roads, the provision of open spaces—private and public—the preservation of objects of historical interest or natural beauty, &c.

The object of a town plan in this respect is thus defined (Section 54, Sub-section 1):—"The general object of securing proper sanitary conditions, amenity, and convenience in connection with the laying-out and use of land, and of any neighbouring lands."

When once these main arteries, roads, open spaces, &c., have been defined in a town plan all developments in the estates included in the plan must be along these lines. Hitherto so long as roads have been not less than a minimum width, and have conformed to certain conditions as to access to adjoining roads, authorities have been powerless to shape the development of their areas. With the adoption of a town plan this helplessness of authorities will cease and all developments must take place on the ordered lines laid down in the town plan.

For the purposes of a town planning scheme any existing bye-laws may be suspended. Under Sub-section (2) of Section 55 the Local Government Board are, for the purpose of a town planning scheme, given power to suspend so far as is necessary for the purpose of carrying out the scheme, any bye-laws relating to width of road, character, and method of roadmaking, &c., governing the present methods of dealing with the areas concerned. This power is of extremely great

## MODERN EUROPEAN ARCHITECTURE.
### GERMANY.



[From *Berliner Architekturwelt.*

THE VILLA LEMM, AT GATOW.—Herr Max Werner, Architect.

importance and will enable local authorities, whilst requiring greater garden space about dwellings, and more open spaces, to relax conditions as to road-making, and thus render possible valuable economies in estate development.

## AN ARCHITECTURAL WALK FROM WESTMINSTER TO CHARING CROSS.

By Percy Fitzgerald, M.A.

(*Concluded from page* 264.)

It is curious that the great work of Inigo Jones—the Banqueting Hall—seems scarcely to impress as much as we might expect. It has even an uninteresting look, and the details seem a little coarse. I believe this effect is owing to its being a mere fragment, for it was intended to have run for a long way down the street in the same style, thus making a great, long façade. The result is the details are over-emphasised and magnified. The addition made by the United Service Institution has a feeble air. It was, indeed, stipulated that it should not attempt to simulate the style of the great building, but it might have harmonised without imitating. I suppose there is not in the front a single stone of Inigo's original building—which must have been renewed once or twice. It is a fact that the whole of the outside of King Henry VII.'s Chapel has been thus renewed three times. Hollar's plate of Charles I.'s execution, with its view of Whitehall Palace, does not at all correspond with its present aspect.

One of the most curious prodigies is an equestrian statue of the Duke of Cambridge set down in the middle of a narrow street, leaving hardly room for the traffic to pass by it. Utterly unknown in London seems the rule that a statue should be the centre of something—should be approached—and have a demesne of its own. Here it is "squeezed in" as it were.

On the new War Office, that Temple of Many Columns, there will be noticed a spreading porch with a door in the centre. It really seems an afterthought and as if fitted of a sudden on to the rest. One might be all but certain that when the building was completed with an unobtrusive doorway the Powers that be came along:—"Here must be a porch with a porter's lodge and side office." And so it was supplied. But it is in a different style and does not match. The reason may have been that the architect was dead and someone else gave a design of his own. When both the architects had died the supreme officials refused to appoint others, declaring that they had clerks of talent in the office quite able to carry out the designs, and so they did.

At the bottom of a little lane hard by to Cox's Bank there is an old Charles II. or Williamite mansion, a fine old-fashioned house that has been unaccountably preserved. How strange to think that many of us have walked past Northumberland House and its lion, with its fair gardens and fine quadrangle—500,000*l*. was the price. The interest of this sum was 25,000*l*. a year. A single house built on the ground—the Grand Hotel—was charged at 10,000*l*. a year rent. So it was really a good bargain for the purchasers.

One of the best statues in London—that of Sidney Herbert, by Foley—used to give pleasure in Pall Mall. It is now in a "back square" of the War Office and is practically lost. This presses hardly on the reputation of a really notable man—thousands had grown acquainted with him through passing him every day, and something of his character was learned from this amiable and tranquil presentment. Of a sudden comes this demolition of all things in Pall Mall, and lo! he is swept out of existence and will never be seen again.

That noble Thane, "the bold Buccleuch," who had to fight for his spoliated access to the Thames had actually, through lack of space, to place his stabling, coach-houses, and offices right in front of his pseudo-Gallic castle. This seems to furnish painful, disagreeable associations; but there they are. They form the "arms" of the enclosure in front, like Bernini's arcade before St. Peter's. Possibly this side of the château is intended for the rear, the front may be to the river.

I well recall among other lost relics of London an old tattered group of buildings which stood about here, and which could be identified as one of Sir John Vanbrugh's works—the "Goose pie" it was called. I used to pass it with great interest, but nobody noticed it, or cared for it, or indeed knew of it. But in truth this is the "coming down" age. I can look back to a time when everything was standing and no one cared to pull down anything. I used to pass the old Tabard

Inn in the Borough and the White Hart, with its Pickwick memories, also a wonderful old inn near Stationers' Hall, a palace somewhere, Sion College, Christ's Hospital, &c. There were the Bishop of Winchester's Palace and old inns galore. Now everything is being cleared away, and greedy eyes are upon the Charter House even.

Who could credit nowadays that the colonnade in front of the old Admiralty was once considered a chef-d'œuvre of the Brothers Adam? It has been engraved in very costly style over and over again. I call it colonnade, though it now does not seem like one. It was intended to screen the hideous building behind it, but it met with truly barbarous treatment, which accounts for its present degradation. It occurred to some Sea Lords when they were giving their receptions that it would be a great convenience if there were several entrances for the carriages, and they proceeded to make them. In its original form the screen was a graceful elegant thing—a row of columns through which the courtyard was seen with a charming portal in the centre. The Sea Lords knocked out and carried away a column on each side and thus opened two fresh entrances—they also ran a wall behind the columns to hide the court!

For the student the whole of Parliament Street offers an interesting subject. There are so many contrasted specimens. We can even study the old French pattern of the high steep roofs and the two wings and many windows, for we pass the Duke of Buccleuch's palace, which, by the way, has supplied a sort of keynote for many buildings behind and near it. The Government office at the corner was the work of the Scotch Mr. Brydon, who was a favourite architect at Bath, and whose style is somewhat reminiscent of that city and of the scenic woods. But the Caledonian nature prevailed, though it did not mate well with the picturesque architect who drew some of his inspiration from Robert Adam. He made an addition to one of Wood's buildings, the town hall at Bath, copying strictly all details, measurements, &c., and yet strange to say, the graceful refined touch could not be reproduced.

The War Office when it made its first appearance seemed very ungainly with its extravagant corner towers, but now that it has been duly "weathered" and the fierce new glare toned down, it has become very tolerable, and fills its place respectably.

One can always admire the robust, honest and plain spoken style of the Horse Guards. For here is the very good sense of architecture; and how pleasantly varied and broken up is the design. There is a healthiness about it, but also an absence of grace. But one day a couple of "storeys" is sure to be added.

Just touching the old and hideous Admiralty, whose four giant columns are said to be out of all proportion, is a well-grimed venerable dwelling house, yet its disfigured grace and beautiful proportion should be noted. It is Adam's work whose exquisite sense of proportion is ever instructive. He "laid out" the front of his house so that it could not be bettered. This will soon disappear.

The architect of to-day would find genuine entertainment in contrasting the different shifting styles to be found in Victoria Street. He can be even taken back to the early Victorian days when the traditions of Nash were still preserved, and he was thought Classical. This is shown in the Westminster Palace Hotel, and the long strip of mansions that face it. The strange double line of balls meant as ornamental are truly curious and prehistoric.

Victoria Street, now some fifty years old, offers a curious and suggestive mixture of treatment. It is curious to compare the different styles. The Palace Hotel and the buildings facing it seem after Nash. Then there is the Albert Mansions, rather rich Palladian; and abundance of terra-cotta treatment. The fine massive stone block facing Strutton Ground, the strange Army and Navy Stores, and the profuse "compo" then all but universal. Where do we see "compo" now? In those old days real "compo" was indispensable. It was thought indecent to display the naked brick. Now brick and terra-cotta are quite out of fashion. We are tired of it; stone is the correct material.

Trafalgar Square has been always spoken of as the finest site in Europe—a strange illusion. But whether this be so or not, there can be no doubt it could have been treated far more artistically. Everything seems astray; the great Nelson Column with its spreading base and lions covers too much ground, dwarfs it, and has not room to display itself. The basins are far too large for the site, and the fountains are not large enough for the basins. Were the latter of half the size and made level with the ground the Square would seem much more spacious, and were a flight of steps made to descend from the National Gallery, and the balustrade removed, a fine prospect would be gained. The poor National Gallery has been a stock subject for ridicule for years with its dome and pepper casters; yet, judged impartially, it is a really Classical bit of work, even of a scholarly kind. Let anyone stand opposite the United Service Club by Graves's shop and look along towards the Gallery, he will see and admit this truth. It will then appear as a fine perspective of Grecian work. Even the front view from Parliament Street has a sort of commanding dignity. The dome, though bare and unadorned, offers a plain business-like aspect. This left wing has been oddly bent back by stages, the first block next the portico being so much, the next so much more. The effect is painful to the nice eye. Poor Wilkins, as is well known, was given by a Board of Works of his day a batch of Corinthian columns which he was directed to fit into his building, rather than make his building fit them. And so he did with good effect. But he had serious trouble and vexations, for the line of his building ran straight to join the line leading to Charing Cross beside the outside wall of St. Martin's Church. The side of the Gallery therefore faced the portico, and the church would be hidden away, being put in a side street as it were. A perfect storm and clamour arose. The poor architect was called ignorant and incompetent, and so the extraordinary step was adopted of bending back the wing so as to leave clear the portico of the church, which was thus brought into the Square. The sloping roads from the terrace are very ugly. The descent is indeed so slight that one might speculate whether a good effect could not have been obtained by not altering the level of the Square. The asphalted area encroached on by the basins is further diminished by the unnecessary row of massive posts set down in a long line, and thus cutting off a substantial portion. The idea, I suppose, was to show that the latter belonged strictly to the street.

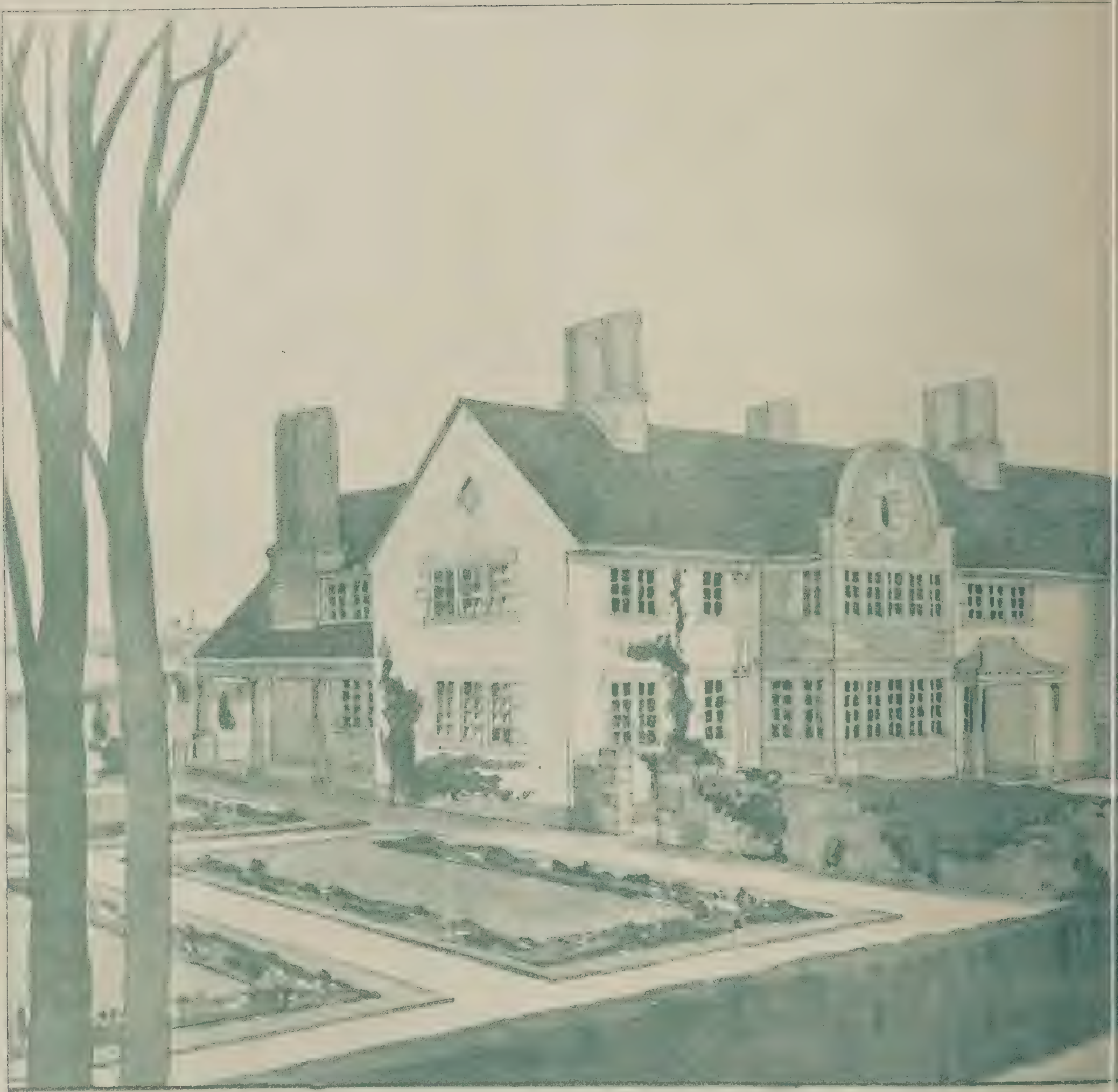
In Trafalgar Square are some wondrous specimens of the statuary art. Here is illustrated the heavily official doctrine that statues may be put wherever there is sufficient space to carry them, and be grouped conveniently together as a family party. Here are two extraordinary warriors standing in line. No regard to the different scales is considered. For a little behind is shown Gordon's rather graceful image; in size he might be considered a boy, as compared with the others. But the horse in Chantrey's George IV. is well worth study, for it has an air of life and proper anatomy; we at once recognise the presence of a true artist. What shall be said of Landseer's lions? Clever sketches certainly, but sketches do not do in works of such a size.

The eye ranging along the roofs of the National Gallery will be arrested by various projections and intrusions which certainly show architectural wantonness. One of these is a sort of lantern, such as is seen at the top of a campanile, and wholly Italian in character, and discordant with the pure Greek façade below. This it seems is one of the decorative ornaments of the new portion of the Gallery within. It might have been omitted for the present, being quite open and serving no purpose. There is also an ugly bell covering which projects obtrusively, a sort of glass dome for one of the new chambers below.

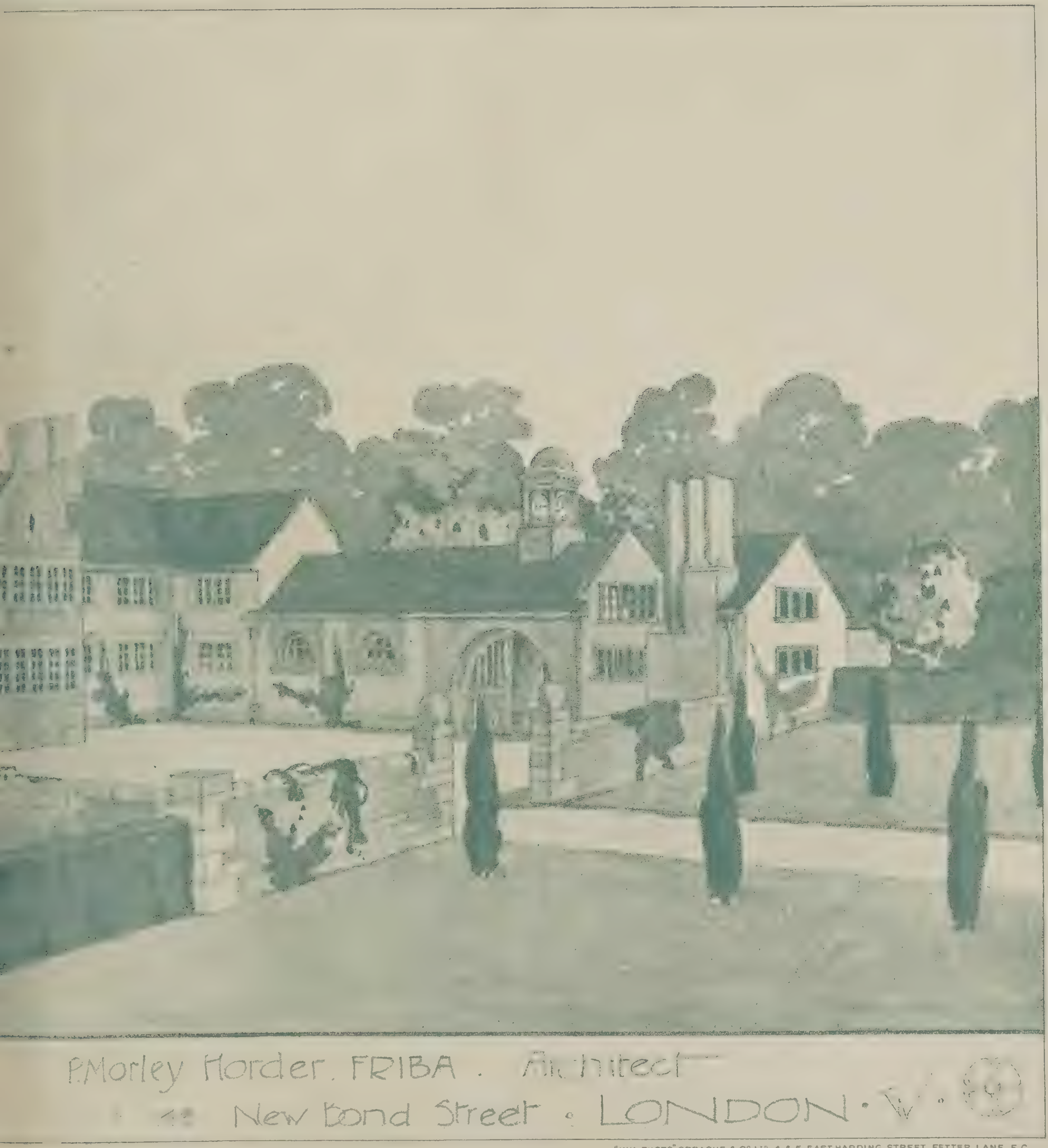
## COMPETITION.

THE competition opened by a committee of glazed brick manufacturers produced several designs of considerable merit. None, however, displayed such a combination of artistic quality with practical suitability to the material as, in the opinion of Mr. Max Clarke, F.R.I.B.A., the assessor appointed by the President of the Royal Institute of British Architects, would justify the award of the first premium to any individual designer. Several of the essays submitted have also been admirable, but in no case did a set of drawings and the essay sent with it attain anything like corresponding excellence. The assessor has awarded prizes as follows:—50 guineas to John Greaves and L. MacDonald Gill, 16 Old Buildings, Lincoln's Inn, W.C.; 50 guineas to Alexander Peacock, Elmswell, Longton Bridge, Preston; 25 guineas to F. Van Baars, 5 Clive Road, Colliers Wood, Surrey; and two guineas to each of the following:—A. Troyte Griffiths, The Priory Gateway, Malvern; J. M. W. Halloy and H. A. McQueen, 55 Lincoln's Inn Fields, W.C.; J. Algernon Hallam, 18 St. Mark's Crescent, Regent's Park; W. Henry Jowett, 38 North Road, Highgate, N.; and Leonard W. Tracey, 49 Rann Street, Ladywood, Birmingham. The glazed brick manufacturers intend to circulate from time to time reproductions of the drawings and also selections from the various essays.

THE Knaresborough education committee advise the County Council to erect a new school to accommodate 200 scholars in place of the condemned Council school.



RESIDENCE AT WIEWIC


P. Morley Horder. FRIBA. Architect
4a New Bond Street · LONDON · W ·

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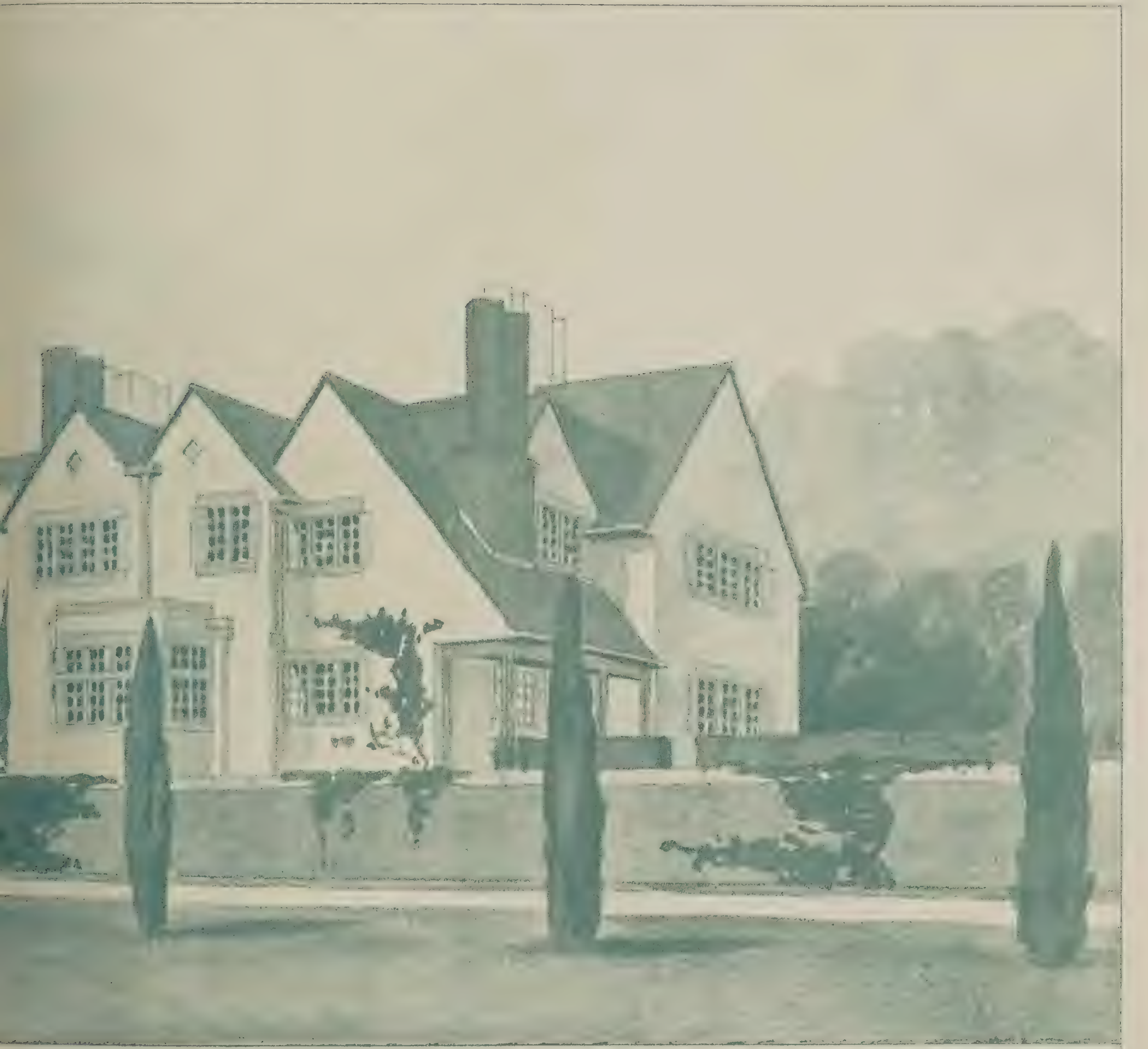
RESIDENCE AT WARWICK.



P. Morley Horder FRIBA Architect
· 148 New Bond Street · LONDON · W.

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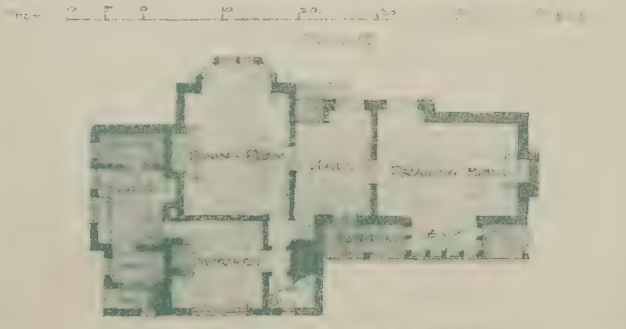

GROUND FLOOR PLAN

# COTTAGE
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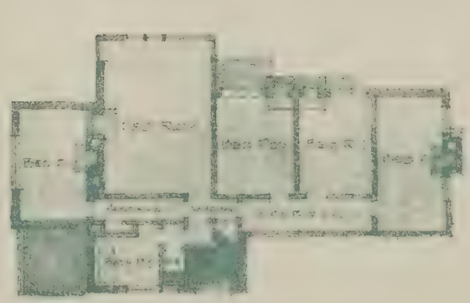
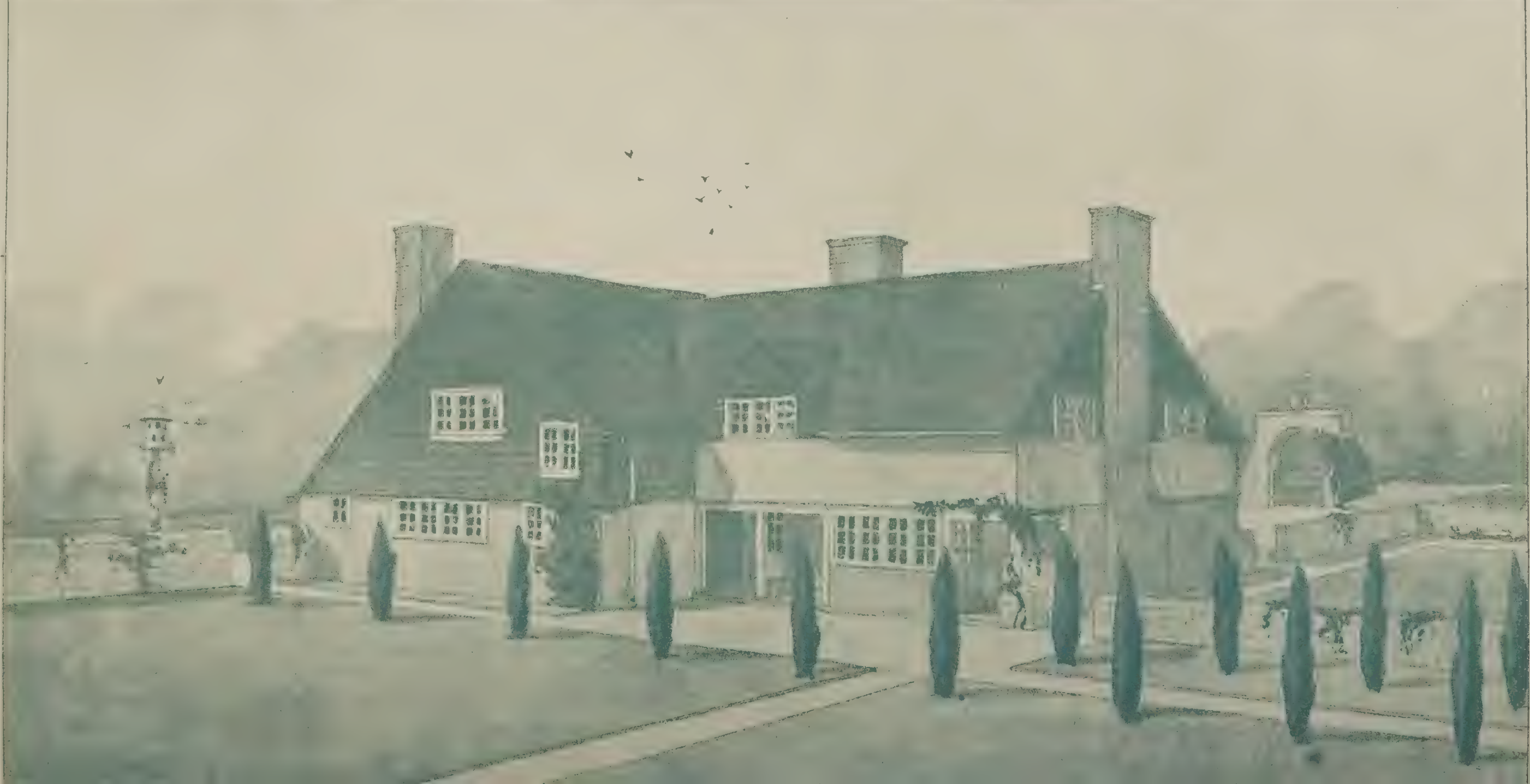
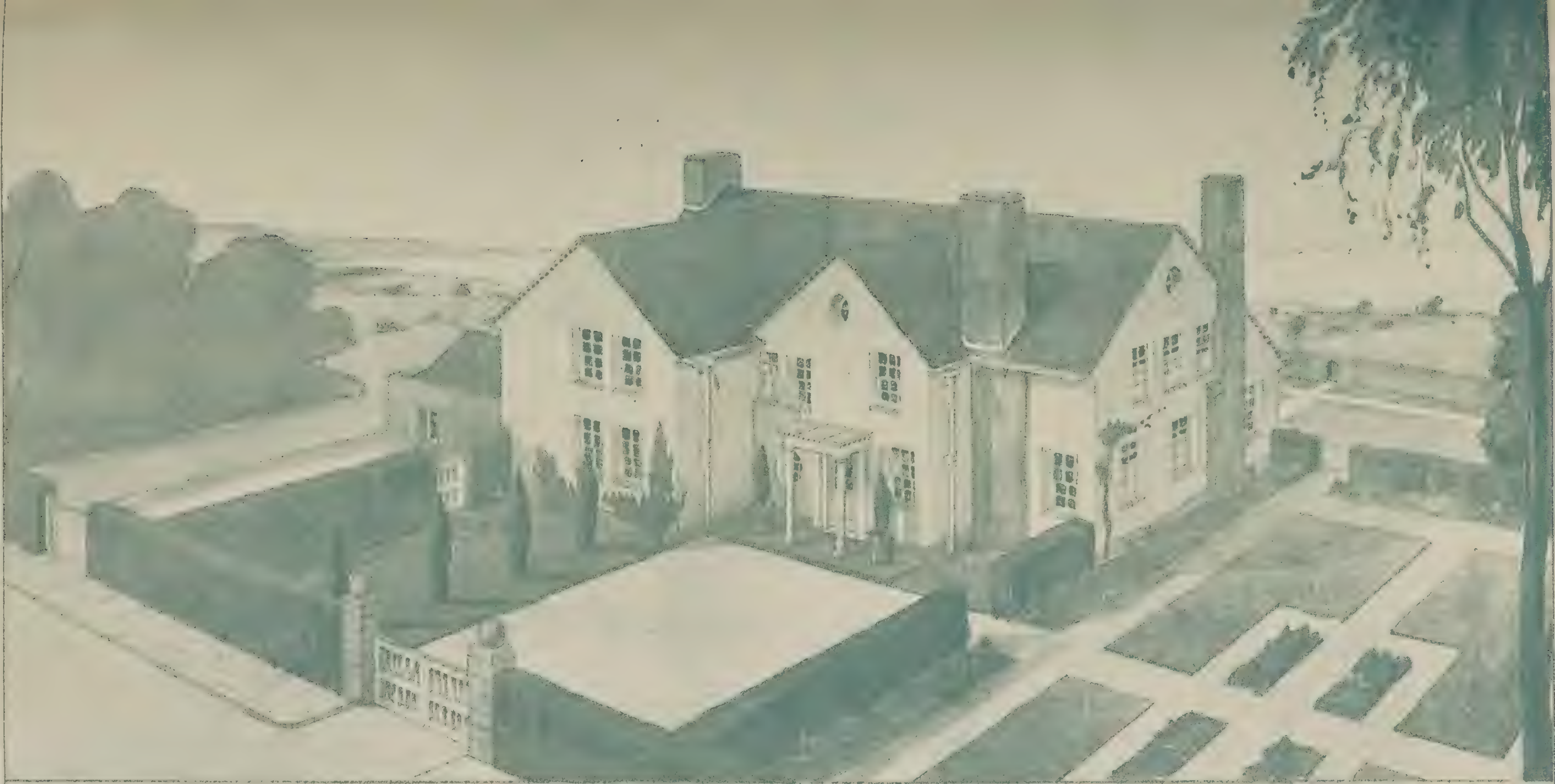
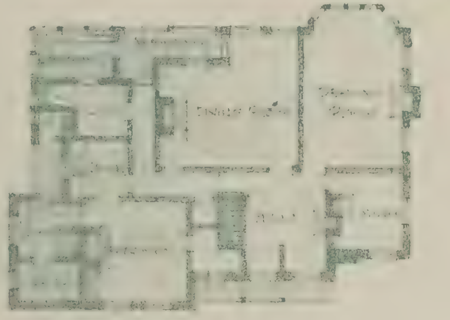
# MELDRETH



·FIRST FLOOR PLAN·







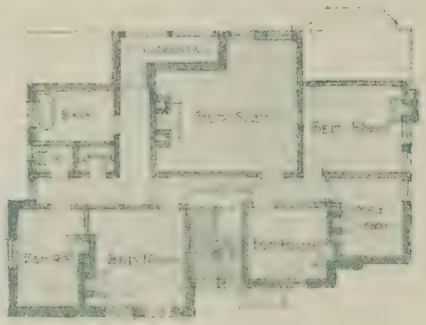
GROUND FLOOR PLAN

# COTTAGE

ERECTED AT

# MILFORD ON SEA

[illegible] Parker
Architect
148 New Bond Street
W.



FIRST FLOOR PLAN

"INK-PHOTO" SPRAGUE & C° L^TD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

# The Architect.

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## FORTHCOMING EVENTS.

*Monday, May 30.*

Royal Institute of British Architects : President's "At Home."

*Wednesday, June 1.*

Royal Society of Arts : Paper on "The Restoration and Discoveries at the Guildhall, London," by Mr. Sydney Perks, F.R.I.B.A., F.S.A., City Surveyor.

Royal Archæological Institute : Paper on "Excavations at Tortington Priory, Sussex," by Mr. P. M. Johnston, F.S.A., F.R.I.B.A.

Carpenters' Hall : Exhibition of Works in Wood and Wood Carving. Exhibition closes on June 11.

*Thursday, June 2.*

Edinburgh Architectural Association : Annual Excursion, Floors Castle and Kelso Abbey.

*Monday, June 6.*

Royal Institute of British Architects : Business Meeting ; Annual Elections.

Society of Engineers : Paper on "The Inspection and Testing of Engineering Materials and Machinery," by Mr. C. V. Biggs.

## SOME WEST COUNTRY SANDSTONES.

FOREST OF DEAN and Blue Pennant are names known to a good many architects from their early studentship days, but possibly few realise what these names imply. Blue Pennant, for example, is only one variety of what is more correctly known as Bristol Pennant, the quarries for Pennant stone being situated on the immediate outskirts of the city of Bristol.

Although the bulk of the Pennant stone is a beautiful even grey-blue in colour, and in consequence has been largely used for altar and chancel steps in the interior of churches, it is pre-eminently a hard-wearing and weather-resisting stone, and possesses with equal durability to granite the great advantage of never becoming slippery in wear by reason of its fine grain and uniformity of composition.

The blue colour, although predominant, is not universal. There is a pink variety, locally known as Red Pennant, which is even harder than the blue and like it even in tint and fine in grain. Then there are occasional mixtures of colour and gradations between blue and red, particularly in the Huckford quarry at Winterbourne.

Whilst the Pennant quarries afford stones of any reasonable size, and "scantling lengths," so valuable for steps and landings, are readily obtainable, there are naturally many stones produced which do not come up to the quarryman's ideal and hence are contemptuously styled "shoddies." But there is nothing shoddy about them from either a constructional or artistic point of view. They may be too small or too much varied in colour—a blemish in the eyes of the quarryman—to serve as steps, but they are just the thing for building walls when texture is desired.

Another charming red stone obtained from near Bristol is that known as Red Wilderness, quarried exclusively at Mitcheldean. It is a wonderful and fearsome sight to see the quarrymen here at work. By some vast upheaval the original strata of deposition have been tilted up till they run at an angle of some 40° or 45°, and whilst getting the stone or clearing away the rubbish or débris—"ridding," as it is called—the men have to be held up by ropes, as if they were working on the roof of a house.

The stone thus obtained is of a brighter and more pleasant colour than other red stones in the country that approach it in fineness of texture, whilst those that may rank with it in colour are for the most part coarse-grained or soft. In durability Red Wilderness stone is unsurpassed by any other red stone, and its hardness and fine grain fit it for use in steps and paving, although it is rather as a building stone that its beauty of appearance leads one to desire to use it for dressings or for walling either with a rubbed or hammer-dressed face. As with other sandstones, though large blocks are readily obtained, there are also thinner beds and smaller stones which produce the so-called "shoddies" so useful and admirable for walling.

Still in Gloucestershire we have the Forest of Dean, that weird and wild expanse of country which in Nelson's time was planted with oak trees so that material might not be lacking for the future supply of the wooden walls of old England. The timber has grown to maturity, but the wooden walls are superseded. The Forest of Dean is still a forest, but its economic value is rather as a store-house of stone and coal than of timber. For in the Forest of Dean the sandstones that are used for building lie immediately above the coal-beds, and a worked-out quarry becomes a coal mine.

Forest of Dean stone has had a high reputation for very many years, more particularly the blue variety, inasmuch as reliable stones with a distinctly blue tint are not numerous. The popularity of blue Forest of Dean stone has rather overshadowed the merits of the lighter or warm grey-coloured stone, which has also to stand in competition with many other sandstones of similar colour in other parts of the kingdom.

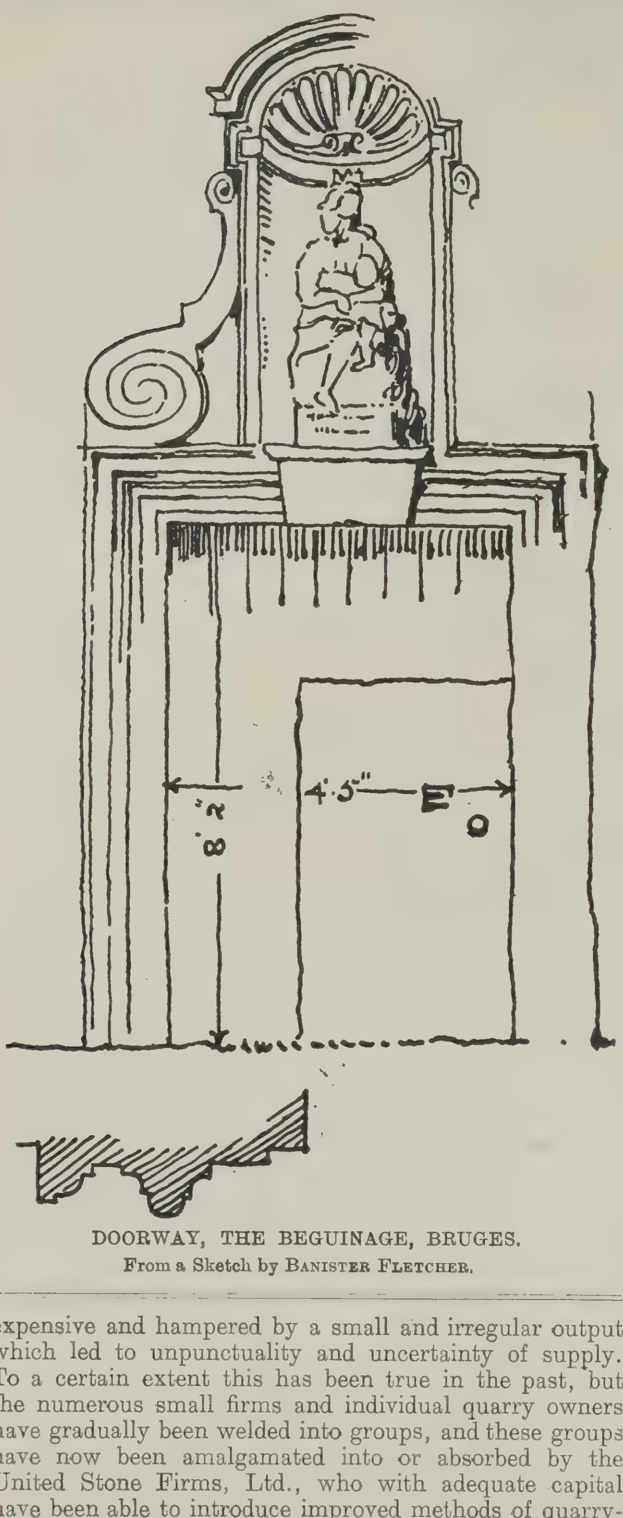
This grey stone from the Forest of Dean is, however, able to hold its own as regards quality with any other sandstone of similar character, strong and durable, very fine in grain, and remarkably uniform in texture and colour, the latter of which it retains well.

The strength and reliability of Forest of Dean stone is proved by its successful use for engineering work, particularly for engine-bed blocks, in which uniformity and freedom from hidden faults is a primary essential.

The blue stone from the Forest of Dean is easier to work than Blue Pennant, and hence the popularity it has attained, for combined with this good point it nevertheless weathers well and keeps its colour, which is rather brighter than that of Blue Pennant. In this latter, by the way, we personally prefer the effect of a rubbed surface, which, to our mind, brings out the depth of colour in the stone without accentuation of the sombre effect to be seen in a hammer-dressed face.

Some of the blue beds in the Forest of Dean are harder than others, and these are especially suitable and frequently used for staircases and landings, where good-wearing qualities without slipperiness are desirable.

We have thus in the West of England a remarkable group of excellent sandstones whose merits as stone have indeed been admitted and recognised for generations, but which, as far as our experience goes, have not been very generally used by architects, from a feeling that they were



DOORWAY, THE BEGUINAGE, BRUGES.
From a Sketch by Banister Fletcher.

expensive and hampered by a small and irregular output which led to unpunctuality and uncertainty of supply. To a certain extent this has been true in the past, but the numerous small firms and individual quarry owners have gradually been welded into groups, and these groups have now been amalgamated into or absorbed by the United Stone Firms, Ltd., who with adequate capital have been able to introduce improved methods of quarrying, the most efficient machinery for working, and a well-organised system of delivery.

The stones of which we have been speaking are all obtained from open quarries, not mines, which means that powerful cranes and engines can be advantageously employed in getting the stone. This is one point in which a strongly capitalised company has a great advantage over the small man who is owner of a single quarry. There is a reduction of cost in the primary business of getting the stone.

Again, the resources of a single quarry in the supply of a particular size or quality of stone are limited, and in the past one frequently had to wait because the stone wanted was not immediately available. With a company owning a large number of quarries this difficulty is removed. Then the wealthy company can keep the best machinery and workmen always ready for working the stone. And here we may strongly urge as a feature of these West Country stones the advantages of quarry-worked material. The cost of carriage is lessened, the stone is worked by masons who know its peculiarities,
there is less temptation to use unsound or unsuitab
blocks. The objection to possible damage in transit
obviated by the employment of men who do nothing el
but pack stone and are experts at the business.

The net result of the amalgamation of ownership
numerous quarries and works by the United Stone Firm
Ltd., is that some of the most excellent building ston
in the kingdom can now be supplied with promptitu
and certainty at lower cost than that of inferior stone
which have successfully competed with and kept the
out of the market in the past.

## NOTES AND COMMENTS.

Some feeling seems to have arisen at Liverpool becau
the name of Lady Chapel has been applied to the si
chapel which is the first portion of Liverpool Cathedr
to be built, and which, it is expected, will shortly be co
secrated and used for service. Strictly speaking,
course, there is no such thing in a modern Anglic
cathedral as a "Lady Chapel," but everyone who h
studied our ancient large churches has become so accu-
tomed to the term that it is often used loosely and witho
any such implied approval of doctrines and ritual that a
not now recognised in the Church of England as son
purists would seem to fear. One might as well obje
to the name "Minster" or "Abbey" being given to a
ecclesiastical edifice now used by the Church of Engla
because in that Church the monastic system is no long
in full vogue.

Southampton has for many years past been in urge
need of a real municipal building or town hall for t
accommodation of the numerous officials and their st
that the modern development of municipal services h
brought into being, and it is rather amusing to find th
a proposal to acquire freehold premises at the cost
6,300*l.* for the accommodation of the Tramways Depa
ment has been the occasion of a lengthy discussion by t
Town Council, in which it was urged that it was real
time for the town to consider the advisability of looki
into the question of the necessity or wisdom of erecti
municipal offices instead of renting more or less inco
venient offices in various parts of the town.

The value of the Board of Trade Labour Exchang
is difficult to assess from the figures that have been pu
lished. At the end of April there were 81,523 applic
tions on the register of persons unemployed, which, co
pared with 90,627 at the end of March, might be taken
show that there were fewer unemployed. But when
read that the total number of applications received duri
April was 116,523, and the number of vacancies filled w
23,858, it is possible that the hard fact that Labo
Exchanges cannot make work has impressed itself
the hearts of applicants, and that their lessened numb
is but the result of hopeless despair at the inability of t
Labour Exchanges to find employment for the thousan
whose services are not required because there is n
enough work to go round.

By the decision of Mr. Justice Parker in the case
the Hopton Wood Stone Firms, Ltd., *v.* Gething it
established that Hopton Wood is Hopton Wood wheth
it comes from the Hopton Wood quarry, Killer's quarr
or the Manystones quarry, and whether it is obtain
above the Toadstone or below it. The defendants are n
to be prevented from carrying on business under the sty
of the "New Hopton Stone and Marble Quarrying Co
pany" or from selling the particular brand of stone th
is so well known to architects as "Hopton stone"
"Hopton Wood stone," names of a particular kind
stone between which the learned Judge was unable to di
tinguish. Hopton Wood stone is of a character that
so peculiar to itself that it can hardly be mistaken for a
other stone, and it appears from the evidence given in t
case that this character is maintained by stone fro
several distinct quarries and does not at all depend up
the relation of the beds to the Toadstone.

The Town Council of Doncaster has, we think, acted wisely in rejecting a scheme for the Corporation to build houses themselves on the Marsh Gate land instead of selling in lots to suit purchasers for the erection of cottage houses or shops. It is rarely indeed that a municipal authority can develop a building estate successfully. Either the houses do not let or they can only be occupied at rents that throw a burden upon the rates.

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The Annual Meeting of the Royal Archæological Institute will this year be held at Oxford from Tuesday, July 19, to Thursday, July 28. The preliminary programme includes, in addition to the various places of interest in Oxford itself, visits to Dorchester, Wallingford, Ewelme, Stanton Harcourt, Yarnton, Youlbury, Rycote, Thame, Iffley, Abingdon, Sutton Courtenay, Banbury, Broughton, Bloxham, Adderbury, Witney, Minster Lovell, Burford.

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It is proposed that the Urban District Council of Hexham shall agree to purchase the beutifully-wooded and park-like grounds of Hexham Abbey from Lord Allendale at the price of 6,000*l.*, of which, subject to the approval of the Local Government Board, 5,500*l.* is to be raised as a loan by the Council and 500*l.* is to be sought from public subscription.

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The Society of Antiquaries propose this summer to commence the excavation of Verulamium, which lies a short distance to the south-west of St. Albans. Verulamium is mentioned in a passage in the *Annals* of Tacitus as one of the Roman towns destroyed during the disorder that followed the sack of Colchester and the rout of the Ninth Legion, when "the barbarians, omitting to attack forts and garrisons, directed their attempts to whatever afforded ample booty to the spoiler and was difficult of preservation to those who guarded it." Further interest attaches to the site from the fact that it is supposed to be the "town of Cassivellaunus" mentioned by Cæsar. The walls of the restored Verulamium, which would appear to be as strong as those of Colchester (*i.e.* some ten feet thick), enclose a space of about 190 acres, and not only does the city appear to resemble Pompeii both in size and shape, but the dimensions of the theatres at the two places are almost exactly the same. The great Roman road running from London to Chester, now known as the Watling Street, traversed Verulamium from south to north.

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A notable addition to the attractions that Florence holds out to the lover of architecture and other arts has been made in the opening of the restored Davanzati Palace, in the Via Porta Rossa. Built early in the fourteenth century by the Davizzi family, it at the close of the sixteenth century became the property of Bernardo Davanzati, a man of wealth, learning and ancient lineage. Like many other old Italian families, the Davanzati declined in wealth and influence, and came to an end with the suicide of the last representative, Carlo di Giuseppe. The house, already suffering from the poverty of its owners, fell into the abysm of a tenement dwelling. In 1904 Signor Volpi, the well-known art expert and dealer, bought the palace, and has since been steadily carrying out its rescue from desolation and restoration to a close approach to its former beauty. Frescoes and old woodwork have been brought to light, and Signor Volpi has furnished the palace again with unrestored furniture of its own date.

Cinder and coke breeze concrete is now somewhat out of favour, largely from the bad name given to it by German authorities as being prejudicial to steel. It is well, therefore, to know that its value as a fire-resistant is still to be credited. At Columbia University, U.S.A., the walls of huts prepared for fire-tests have been constructed of cinder concrete, and after repeated use for four-hour tests at 1,700° F. have remained in good condition except for surface damage from a 60-lb. nozzle pressure stream of water applied in each case when the walls were red-hot.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute was held on Monday, the 23rd inst., when Mr. Ernest George, A.R.A., the President, occupied the chair. The President at the commencement of the proceedings referred to the very great loss the Institute had sustained in the lamented death of their royal patron. The following address was then read by the Secretary:—

The Humble and Loyal Address of the Royal Institute of British Architects.

*To His Most Gracious Majesty the King.*

May it please Your Majesty.—We, your dutiful subjects, the President and Council, on behalf of the Members of the Royal Institute of British Architects, and of the Societies both in the United Kingdom and in the Dominions beyond the Seas in alliance therewith, beg leave humbly and respectfully to approach your Majesty, and to offer our deep and heartfelt sympathy in the loss your Majesty, the members of the Royal Family, and the Nation have sustained by the death of your Royal Father, our late Most Gracious Sovereign King Edward VII. His late revered Majesty encouraged with his Royal and generous patronage the art that is so dear to us, and we mourn with deepest sorrow not only, in common with the rest of the British Empire, our beloved Ruler, but also the gracious and beneficent Patron of the Royal Institute. We most respectfully and dutifully tender to your Majesty our sincere devotion and loyalty on your Accession to the Throne, and earnestly pray that the Almighty will grant your Majesty and your Royal Consort Queen Mary a long, happy, and glorious reign, during which the Nation may prosper, the arts flourish, and your Empire enjoy all the blessings of peace.

Given under the common seal of the Institute.

Mr. E. T. Hall said that in dealing with such a subject as that address it was difficult to say anything new having regard to the fact that during the past fortnight so much has been said with regard to his Gracious Majesty. But the Institute were in a special position and could strike a different note to that struck outside in that they were mourning the loss of their patron. There had been in the past, said Mr. Hall, many emperors and kings who were great patrons of the arts; but their demise had usually been received with equanimity by their own subjects and with joy by alien peoples. Whereas we have seen in the last few days the entire world pay homage to our great King. That alone will differentiate him from the other royal patrons of art. Another characteristic is that he never specialised in his treatment of any one of the arts. King Edward appealed to his peoples in a way that was absolutely unique because each individual and each community has been touched by the warmth of his personality. In the three minutes silence on Friday last when all traffic was suspended there was a more striking tribute than in the music from all the massed bands in the world. It was only left for them to express the deep sorrow felt at losing their great ruler, and, while doing this, to also tender their loyal devotion to His Majesty King George V. Under his wise guidance they looked forward to a day of great things for the art in which they all took so much interest. It was their prayer that His Majesty may be blessed with health and strength long to reign over them.

At Mr. Hall's suggestion the meeting rose and stood in silence. Mr. Ernest George announced that the Council had decided to postpone the Town Planning Conference and the date of their annual dinner.

Mr. Henry T. Hare, hon. secretary, announced the death of Mr. H. L. Fedden, F.R.I.B.A., and of Professor George Aitchison, R.A., elected Fellow 1862, vice-president 1889-93, and president 1896-9, Royal Gold Medallist 1898. They would, he said, all feel that they had lost in Mr. Aitchison one of their most distinguished presidents and a most distinguished architect. His tenure of the chair was marked by extreme ability and the greatest geniality. The Institute felt they had lost a very good friend. A vote of condolence was passed to the relatives of Mr. Aitchison.

Mr. E. A. Rickards, F.R.I.B.A., then read a paper entitled

### The Art of the Monument.

The word "monument" here stands for any sort of erection of a purely ornamental, commemorative, or even abstract purpose, as distinct from that of a utilitarian nature. In short, the art of the former is the art of expressing and imparting an idea; the latter that of embodying a definite and material purpose. In most cases of the former sort some presentment of the human figure is included; and it is the relation which the human element with its association of a practical and tangible world bears to the abstract with which the artist is concerned. It is this blend of the living idea with that of the serene or spiritual atmosphere which has given the successful examples their continued attraction, and the quality of immutability. Watteau and his school had this idea of a half-way world in their fêtes champêtres, and it has been kept alive by French painters until the present day. Mr. Sims likewise continually recalls this point of view with infinite suggestion to those interested in securing some element of freedom in the smaller monument. No better plea for the semi-realistic treatment of the smaller subject in the matter of a monument could be advanced than his picture in the Tate Gallery entitled "The Fountain." In the small gardens of Paris, which occur so frequently in some of the busiest neighbourhoods, and in the delightful creations of Vienna, the same note is struck.

The intimate nature of the smaller monument demands that it should be easy of approach, and yet have nothing of the vulgar display of the shop-window. Its subtle appeal should be heard above the din of the noisier world. The very quality of its realism necessitates a small oasis in which we can come to terms with it; and, besides, the ensemble of any small composition is neither to be observed in the crowd nor appreciated in the full glare of the open, where it is lost in space.

Public monuments should be allotted to positions prepared in advance. If they do not actually form an integral part of our buildings, at least they should be in the shadow of such as have that dignity and breadth that might enhance the more plastic art of sculpture. Moreover, the buildings would suggest material for the architectural portions of each monument, so that its harmony with immediate surroundings would be secured and a resultant scale of detail adopted in all its parts.

The time may not be so far distant when those who carry out work of a large and public character will be allowed some jurisdiction over those things which should really be necessary to the general or dominating composition; but the fact remains that once the building line is crossed this is very rarely allowed. Yet architects are more and more embodying sculpture, often as a literal advertisement of the purpose of the building itself, and in some cases the chance of including an almost detached monument or a series of monuments does occur. It would be taken advantage of much more frequently if architects had not such a cold and aloof attitude towards sculpture. The great display of this art on so many modern London buildings does not always show a real understanding of how to exploit it. Just as in a façade the design is scarcely or not at all affected if niches remain unadorned, so certain portions and spaces might be allowed for future possibilities in the way of accessory monuments or decorative features.

When the smaller monument which embodies a single figure is placed in such an atmosphere as a large park or garden or expanse, multiplication certainly enhances the value of each individual design. Some standardisation in the matter of the pedestal and accessory foundations, as in the Tuileries gardens (of course, with every variety of detail suitable to each separate case), would result in a great development of this art of exploiting and enhancing the work. The sculptor would then have something of a definite scale to which to attune his creation, and though free within limits, would be led, as were the Greeks, to a consistency of treatment of portrait figures which might lead to great perfection in style, or at least some parallel methods which might be commonly developed.

When the monument is of any considerable size and includes several figures, symbolical and otherwise, it becomes a question whether the effigy of the person commemorated should surmount the whole composition. The architectural details of the containing and supporting parts of this should bear some relation to the neighbouring architecture which dominates it; but this should be, like the sculpture itself, somewhat more delicate if more free in treatment than that which has to be merged into a larger mass of design and definitely linked to the continuous rhythm of a façade. This delicacy, or rather the smaller scale of its features, would allow of far more plasticity in blending the sculpture with the architectural lines; and it should be borne in mind that it is to be more intimately approached than the decorative features of a building of any size, if the literal message to be conveyed is to be apprehended.

With all this nearness of approach, the monument has still to be of very small proportions if the portrait figure is to dominate. Even with any accessories which it is possible to group with it, it is difficult to compose a mass of adequate weight to do this unless the scale is increased to coarse proportions. More legitimate means might be found to surmount the monument, perhaps by a graceful form of some
allegory or purely decorative feature, and the portrait figı
introduced rather as a salient feature, within the range
intimate approach, but not necessarily to be seen and rec
nised from any distant view.

Like any other branch of design, it is the experiment whi
keeps this art of the monument alive, and we are far
content in this country to continue on the lines of establish
precedent, very often without a real understanding of t
subtle qualities of the examples emulated. Take as
instance the famous Colleoni statue at Venice, which has be
the type affected by so many modern creations. In the origir
the horse is placed so that it appears to be walking right
the pedestal, in which this effect is accentuated by the ve
strongly emphasised vertical lines formed by the columns a
decorations worked into it. The resulting effect is no loss
balance in the design, but rather that of extreme vitality a
force, especially when it is viewed from the front with the ho
coming towards the spectator. Yet in an example not f
away this effect of vitality is qualified by the horse being rais
on a crude sloping mound of a base, merging the whole co
position into a pyramidal form which has no relation to t
plane of the ground in its crudity and lack of any horizon
forms, nor any insistence of a division between the c
ventional support and the sculpture above. Yet this cru
ensemble of a monument is placed in one of the few form
vistas of our most fashionable town garden. The art of t
monument has been too little studied, and outside Paris a
Vienna there seems to be no school of this design or no jurisd
tion over such instances of the placing of works of art. Arcl
tects are introducing sculpture into architecture to an exte
which bids fair to become vulgar, but in the case of the pub
monument, architecture has but a modest record.

We are always hearing that the sculptor must be educat
in the principles of architecture, so that he may be able
introduce this into the works entrusted to him; but it is f
more important that architects should train themselves m
to the appreciation and therefore the knowledge of how
embody sculpture in their own conceptions, and then th
would be justified in claiming to be more concerned in t
erection and design of monuments. In the case of t
elements so distinct in character as architecture and sculptu
being employed in a design, it stands to reason that one or t
other must predominate or no balance of effect is anyh
possible.

In the South Kensington Museum there is the mo
originally made by Stevens for the Wellington Memori
in St. Paul's. In it unquestionably sculpture is t
dominating feature. The architecture is reduced to t
merest support for the display of the figures. Its reticen
is remarkable, although it is delicately elaborate and in
harmony with the more plastic forms it seems to tie togeth
It frankly asserts its position as furniture of a large interi
where these forms can be treated on an adequate scale, a
attempts no display of imitation beyond the fine simpl
treated and more delicate mouldings necessary to secure t
balance of the parts and bring the whole design gracefully
the horizontal rest at its base. The memorial lost much
execution. The introduction of the arbitrary forms of t
curved pediment to the arch, the little pediments under t
side figures which destroy the beautiful resolution of the sw
of the sculpture into the cornice line beneath, and a gener
feeling of tightness which is augmented by the harshness
contrast between materials, all go to support the argume
that here was a case in which the sculpture was the p
dominating of the two elements and the insistence of t
architectural forms uncalled for.

For a monument in which the sculpture to predomina
would pass all bounds of due relation to the life and surroun
ings in the midst of which the memorial might be set, the on
satisfactory way would seem to be to treat it as a unit of t
whole. That is to say, conceive it either as the focal point
interest in a scheme of abstract or architectural forms
design or let it be repeated as a point of emphasis and sub
dinate to the general composition. An effective illustrati
of the former idea is the memorial to the Empress Elizabe
at Vienna which occupies a corner of the Volksgarten a
joining the Hofburg Theatre. In the case of a monume
placed in an open square under the shadow of buildings of
certain scale and in close relation to the life and huma
interest of a city, a repetition of interest spread over the who
monument, or rather, what might be called a composite desig
might solve the question of scale and relation to the neighbou
hood of its setting.

Any isolated structure of this nature, however beautiful
carried out and composed in itself, is doomed to failure, a
even to an appearance of the ridiculous, if it be on a scale
compete with the sovereign element of architecture itself; f

it is understood that the effect of buildings is not due to mere vulgar bulk of masonry, but rather to their other qualities of proportion and fitness of material and design. These are not to be threatened if the general friendly relations are to be maintained. The small state is to be repressed unless the suzerainty be augmented in power.

The art of the monument consists chiefly of understanding and expressing its relation to our life in the widest sense as embodied in ideals, purposes, and material effects, and if our future attempts in this art are to have any success when prompted by these considerations, others here may assist in suggesting how this may be best achieved.

Mr. **Howard Ince**, in proposing a vote of thanks, said that Mr. Rickards had addressed the meeting not as a mere theorist, but as one who had given particular attention to his subject and with splendid results. The sympathetic way in which the subject had been treated would serve as evidence to their sculptor friends that there is a very sincere desire to improve the art of the monument. After all this art of the monument was making history, and the nation will be judged as to their character and state of civilisation by those results which will be attained by a combination of the sculptor and architect. The attainment of success demands on the part of sculptors a sense of reciprocity. The example of their French compeers who associate themselves from the beginning with architects in the arrangement of their designs should be followed by sculptors in this country. Mr. Rickards had rightly alluded to the importance of the setting of a monument, for just as no one would think of hanging a picture without a frame so a work of sculpture wants a frame. It follows that we must be wrong in following our almost invariable custom of placing our public monuments on refuges which are usually the by-products of the surveyor's plans. Most of those present would have noticed the monument to Cardinal Newman near the Brompton Oratory; in his opinion it was a most pleasing one. It possessed the additional attraction that there was no back view, which was so often an unsatisfactory feature and like the back of a painter's canvas. The question of setting had even a political importance. In India and other dependencies where ideas were different to our own a statue of a ruler placed in the open without any canopy or protection is a subject of ridicule and a great delight to the disaffected sections. This fact raises the question of the treatment of public statues. Anyone who has tried to solve this problem even in an elementary way will look with respect on the Albert Memorial. The canopy has a quiet restful appearance of shelter and security. In placing a statue in combination with a building a lesson might be learnt from the statue to the late Duke of Cambridge in Whitehall; for a soldier it seems to be in a most unstrategic position. It would have been better placed in the Admiralty or new War Office. There are in existence sites like the open screen at Hyde Park Corner which might be used without any very serious call on the Exchequer. Mr. Ince concluded by expressing a hope that Mr. Rickards, who had already had a considerable influence on painting and sculpture, would in the future have an opportunity of associating himself with some important national memorial.

Mr. **Bertram Mackennal**, in seconding the vote, expressed a strong protest against the general impression that a portrait statue was the only possible form of monument. To his mind there was no feeling in such a statue; whereas the monument ought to be reminiscent of a man's life and work and personality. For instance, suppose a monument has to be put up to some great horticulturist. To erect a statue would be ridiculous; what more suitable than a well-arranged open green sward, with perhaps an urn containing the flowers that he loved so well. Equally unsuitable would be the conventional style of monument to the memory of a man like Darwin.

Mr. H. H. **Statham** expressed a wish to support the vote of thanks for the very clever and interesting paper. He pointed out that the statement by a previous speaker that French sculptors and architects work together on monuments might be qualified by the fact this was scarcely a native virtue inasmuch as most of their monuments are Government commissions, and the Government take good care that the two do collaborate. With regard to the Wellington Memorial in St. Paul's it had always seemed to him that the upper storey of the architect's design and of the actual structure was rather too high and out of proportion to the lower storey. The question of monuments to contemporaries had been raised. To him nothing was more depressing than the ghastly figures of frock-coated men, and custom only emphasises a materialism which artists wanted to get rid of. The French never, or at least very seldom, make a complete portrait statue of a man; they increase the interest of a portrait bust by adding something with reference to his life and work. With regard to the desirability of placing monuments on fitting sites there was, he thought, a very good example in Paris of how not to do it in the monument to Alfred de Musset. The memorial itself is all that could be desired, but it has been placed in a position that is little less than absurd; it stands in the middle of the pavement in the Rue de Rivoli. Reference had been made to the probable demand for monuments to the late King. Mr. Statham said he would like to draw attention to an admirable suggestion which appeared in the *Times* recently from an anonymous correspondent; probably many had not noticed it as it appeared in an obscure part of the paper and in small type. This was that the best memorial to King Edward would be to make a new façade to Buckingham Palace. Unless this is done there will be the great sculptured group of the Victoria Memorial in front with a very commonplace façade behind it.

A vote of thanks having been passed, Mr. E. A. **Rickards** replied to some of the points raised.

## NOTES ON BOOKS.

"The Principles of Architectural Design." By Percy L. Marks. (London: Swan Sonnenschein & Co.)

Though, perhaps, scarcely so successful a work as the author's earlier book on "The Principles of Planning," the young student of architecture will find at the reduced price at which Mr. Marks's "Principles of Architectural Design" is now being offered that he will obtain material for profitable thought in one of the most important and most difficult of all the varied branches of study that go to make the complete architect. All art must be founded on principles, and architecture no less than any other art. Doubtless the thorough artist is largely independent of analytical investigation of the principles on which he works. But the principles exist all the same, and every aspirant to ability in architectural design may not be able to apply those principles sub-consciously, and so will be helped by some guide to their conscious recognition. Hence a work such as this which points out some of the vital principles is of value to the student. But to be of the fullest value he should take nothing in Mr. Marks's dicta for gospel, but rather as material for thought and criticism. We do not ourselves by any means agree with all that Mr. Marks says, but if he induces thought in the architectural student, he achieves a valuable result.

"Buildings for Small Holdings. Materials, Cost and Methods of Construction." By Thomas Potter. (London: B. T. Batsford. 3*s*. net.)

In small holdings, farm buildings and a residence are necessary, and too often their capital cost is a severe handicap on the financial success of the occupier. It is imperative therefore that this cost should be kept down to the minimum, and this is the problem Mr. Potter sets himself to help his readers to solve. To do this "it is generally understood that local building by-laws will not be rigidly enforced," and concrete and timber are to be largely used. The author goes very thoroughly into the consideration of cost and advantages of various materials and methods of construction, and has produced a concise little handbook that should prove most valuable for those for whom it is intended, the occupiers of small holdings of fifty acres or less.

"Practical Housing." By J. S. Nettlefold. With a Preface by the Right Hon. Alfred Lyttelton, K.C., M.P. Popular edition. (London: T. Fisher Unwin. 1*s*. net, paper; 2*s*. net, cloth.)

This book may be said to deal with the question of the housing of the people from the point of view of the practical philanthropist, of the man who realises that housing schemes ought and can be made to pay a moderate return on the capital expended, without perpetrating the folly of building houses so expensive that the people for whom they are intended can only afford to live in them when they don't pay the rent.

The author recognises that in practical housing there are two main divisions of the subject, the cure of existing evils and the prevention of future evils. In the first division the author treats of the effects of the Housing of the Working Classes Act, 1890, and shows how as a general rule it is advisable to proceed under Part II. rather than Part I. Practical examples as well as theoretical show how the provisions of the Act of 1890 have been and can be put into force to remedy existing evils.

It is, however, the second division of the subject that affords the author the best opportunity of showing how economy of health is to be gained from intelligent town planning, and in this direction he does not omit to point out how our usual local by-laws, rigidly enforced, are prejudicial to the well being of the community. Illustrations are drawn from the various garden-city developments that have already exemplified the gain in healthy conditions and amenities that may be obtained by wise and rational town planning.

The book is one that should be carefully studied by every member of any local authority that may be called upon to deal with the actual working of the Housing and Town Planning Act, 1909.

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"Housing and Town Planning in Great Britain, being a statement of the Statutory Provisions relating to the housing of the working classes and to town planning, including the Housing, Town Planning, &c., Act, 1909." By W. Addington Willis, LL.B. (Lond.), of the Inner Temple, barrister-at-law. (London: Butterworth & Co.)

This book treats of the subject of housing and town planning from a legal point of view. The Housing, Town Planning, &c., Act, 1909, does not stand alone, but is largely composed of cross-references to the provisions of previous statutes and a copious contribution to the already numerous amendments of the Housing of the Working Classes Act, 1890. Such a handbook as we now have before us is therefore vitally necessary for a fair comprehension of the present state of the statute law as regards Housing, and the author has clearly combined under various subject heads the co-related provisions of the several Acts. Thus all the stipulations concerning any particular point are brought together, and by means of an excellent synopsis and good index are easily capable of reference.

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"Handbook to the Housing and Town Planning Act, 1909." By W. Thompson (Richmond, Surrey). (London: National Housing Reform Council. 1*s.* net, paper; 2*s.* net, cloth.)

This book by Alderman W. Thompson, of Richmond, Surrey, deals with the subject of housing and town planning from the point of view of a practical administrator, who has already shown his competent grasp of the subject in his previous works, "The Housing Handbook" and "Housing up to Date," which, in conjunction with the present volume form a valuable vade-mecum for members of the various local authorities that have to deal with the subject, and for architects who have to work with the authorities.

The book contains the text of the Housing and Town Planning Act, 1909, with explanatory summary and notes, and a special index to the various sections to facilitate easy reference on a given subject to the Act itself.

The rules and forms issued by the Local Government Board up to the present time with reference to appeals, and to closing and demolition orders under the new procedure, are also given. There is in addition a useful statement showing what sections in previous Acts are affected by the new Act, and to what subjects the alterations relate.

The summary shows in separate articles what authorities will administer the Act; how to get land and money for new dwellings; what may be done with the land; how to make a local authority carry out its housing duties; how to make neglectful landlords keep their houses clean and in good repair; how to get large slum areas cleared; how to deal with obstructive buildings and cellar dwellings; the procedure for closing and demolition orders, and a number of minor matters that are dealt with by the Act.

The town planning portion of the summary explains who will make the town plans; what lands may be the subject of a town plan; what are the objects of a town plan; the general provisions and special provisions that must be made; how to make a town plan; what compensation is payable; how the town plan will be carried out; and concludes with practical suggestions for municipal action. There is also a special chapter dealing with the new powers and duties of County Councils under the Act.

The method of showing in bold type the more important enactments in the text which characterised the previous publications of the same author has been followed in the present book, so as to show at a glance the main object of any section. The A.B.C. to the Housing and Town Planning Act is a useful compilation for purposes of reference.

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"The Craftsman's Plant Book." By Richard G. Hutton How, A.R.C.A. (London: Chapman & Hall. 25*s.* net.)

The sub-title of this book explains its locus standi, "Figures of plants selected from the herbals of the sixteenth century,
and exhibiting the finest examples of plant-drawing found
those rare works, whether executed in woodcuts or in coppe
plate engravings, arranged for the use of the decorator, wi
supplementary illustrations and some remarks on the use
plant-form in design."

The value of the drawings in the old herbals to t
decorator or designer of decoration lies in the approximati
to conventional rendering which, whilst it is primarily i
tended to give a clear key for the recognition of herbs, at t
same time indicates much of the character of each plan
and suggests the application of its form to decorative us
With over 1,000 illustrations the decorator has here to ha
an invaluable store of suggestion in plant form, and indeed
some cases, rather more than suggestion, where the o
herbalist has rather let his instinct for convention and decor
tion carry him away from truthful and literal portraiture
the plants with which he is dealing.

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"How to Plan a House: a Book for all about to Build."
By George Gordon Samson, architect. (London
Crosby Lockwood & Son. 3*s.* 6*d.* net.)

The title of this book needs but two words to make it co
plete—"to avoid." The author starts with diatribes again
other architects in general, and F.R.I.B.A.'s in particula
Judging from the sample plans which the author shows
evidence of what he thinks ought to be built, there is not mu
chance of his becoming F.R.I.B.A., or being recognised
superior to the other architects whom he condemns. It
needless to criticise in detail the dicta of the author, or t
plans he offers as showing how to plan a house.

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"Bungalow Residences: a Handbook for all interest
in Building." By Percival T. Harriso
A.M.I.C.E., M.R.S.I., borough engineer and su
veyor, Dorchester. (London: Crosby Lockwo
& Son. 3*s.* 6*d.* net.)

"The object of this little book is to assist the layman w
may be contemplating the erection of a bungalow," and
show how excellently—or otherwise—the "layman" may fa
when he is assisted by a borough engineer, rather than
regular architect, who wastes his time in studying the pla
ning and construction of residences, instead of devoting h
best energies presumably to sewers and roads. Generally, t
principles advocated in the text are sound, indeed they a
largely in the nature of platitudes, except to the "layman,
but as the author seems to have designed two or three bu
galows for Lancing beach, we are surprised that he glosses ov
the question of water supply in a single page. The author
plans for bungalows, by the way, seem rather influenced
the normal Lancing type—two old railway coach bodies and
shed between. We do not think the "layman" will get ve
far with his bungalow unless he supplements this book wi
expert advice, and possibly that of an experienced archite
might be better than that of a borough engineer.

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"House Painting, Glazing, Paperhanging, and Whit
washing. A Book for the Householder." B
Alvah Horton Sabin, M.S. (New York: Joh
Wiley & Sons; London: Chapman & Hall. $1.)

For the householder this book may be useful as giving hi
some idea of what is comprehended in the painter's trade, b
it seems that the author expects his householder to do his ow
work. From a British point of view we do not think t
author's teaching makes for good and durable work. There
too much shellac. For instance, knotting "is done by coverin
them (the knots) with a coat of heavy shellac varnish." Tr
the author says "the shellac is supposed to stop" (the exud
tion of resin from a knot) "but it does so only very impe
fectly; however, there is nothing else to do." Has the auth
who claims "an experience of many years" never heard
red lead and size, or of tinfoil? Again, his idea of a primin
coat is to "add a gallon of raw oil to a gallon of ordinar
paint," which is not the way in which a competent Britis
decorator prepares a priming coat. In discussing the base
paint, the author expresses his "belief that a mixture of t
two" (white lead and zinc white) "is better than eith
alone." This belief is not shared by British decorators
experience. A good recommendation is that plenty of tim
should be allowed between successive coats of paint. Thu
although there are some pieces of sound advice, the book
not what we consider a reliable guide for the novice or t
amateur.

## THE SOCIETY OF ARCHITECTS' TRAVELLING STUDENTSHIP, 1910.

SIXTEEN sets of designs have been received in competition for the Travelling Studentship, which is of the value of 25*l*. and carries with it the silver medal of the Society.

The problem set this year was to design a golf club to accommodate 175 members, at a cost not exceeding 4,000*l*.

The Council has awarded the Studentship to Mr. D. W. Coombs, 25 Portman Road, Boscombe, an assistant in the office of Mr. J. J. Shepherd, 115 Old Christchurch Road, Bournemouth.

The work of Mr. Frank Brown of Crumpsall, Mr. E. J. Williams of Leicester, Mr. J. F. Dove of Eastbourne, and Mr. A. J. Turner of Tonbridge has been commended.

The drawings will be on view at the Society's premises, Staple Inn Buildings, Holborn, W.C., for one week commencing June 6, from 10 A.M. to 8 P.M., when admission will be free.

They will afterwards be exhibited in various provincial centres.

## EARLY CHINESE POTTERY.

THERE has been opened by the Burlington Fine Arts Club an extremely important exhibition of Early Chinese pottery and porcelain at their premises in No. 17 Savile Row, W. The mere fact that this society have organised an exhibition is a sufficient assurance that it will be worth serious attention; but on the present occasion the promoters say that "in the several series gathered together it is thought that a large proportion will be of a character novel to members of the club." Such a diffident statement may inspire high expectations, and they will not be disappointed.

The value of this exhibition is first and foremost historical. Most especially is this true of Case A, which contains specimens of Han pottery. The Han dynasty extended from B.C. 206 to A.D. 220, and during that period porcelain was first mentioned under the name of t'zu. It was defined as a hard compact fine grained pottery, the surface of which could not be scratched and which when struck gave out a clear ringing sound.

Until within the last decade the knowledge of this period was most fragmentary. It was not until the researches of the student into Chinese books and of the connoisseur were reinforced by the steam shovel that it became a well-defined commencement of the chain linking the contemporary Chinese work with their earliest known pottery. That is to say, the recent construction of railways in Northern China opened up numerous tombs and caves which have yielded a rich harvest. The greater number of the objects recall the finds of prehistoric pottery made by archæologists in Egypt and elsewhere. Thus there were buried with the dead wine jars, flasks, dishes, bowls, and vases. In Case A there are representations of a cock, farm shed, ram, granary urn, and an ox and two-wheeled cart. As Mr. R. L. Hobson says in the Introduction to the elaborate catalogue:—"One cannot but marvel at the skill with which the potter has idealised the commonplace forms of daily use, and at the force and truth with which he has rendered the forms of living creatures. The same power and skill pervades the ornamental vases, the impressive forms of the wine jars, and the vigorous movement of the hunting and hunted animals on the bas-reliefs. Time has invested the green glazes with the posthumous glory of iridescent tints, but the true virtue of the ware lies in the skilful touch of the Han potter, which was able to convert the simplest materials into noble and artistic forms."

After the Han dynasty there is a break of nearly four centuries until the T'ang dynasty is reached, and even of this latter not much is known, the specimens being only tentatively assigned to the period. Firmer ground is reached with the Sung dynasty which reigned from 960 to 1280, and with the Yuan dynasty which succeeded it; the ceramic productions of these two are generally classed together. The examples shown are chiefly to be found in Cases B and C. Next came the Ming Period, which was supreme between 1368 and 1643. This is the most fully represented at the present exhibition, which practically closes with it. In Case E is the celebrated Warham Bowl lent from New College, Oxford. It was bequeathed to that College by Archbishop Warham in 1530. In the same case are a few other curious pieces similarly mounted in silver-gilt, all probably by English craftsmen of the sixteenth century. Of more architectural interest are the few roof and ridge tiles and the finial on Case K. In another part of the room there are also a couple of figures of mounted warriors which are described as architectural ornaments.

It is not easy to suggest the real interest of this exhibition on both historical and artistic grounds. The very many pieces can only be appreciated by a personal and careful inspection. It may be well to try and picture, while looking at them, what kind of pottery was being produced in this country at about the same dates.

## ILLUSTRATIONS.

### OXFORD COLLEGE SERIES, EXETER.—INTERIOR OF CHAPEL.

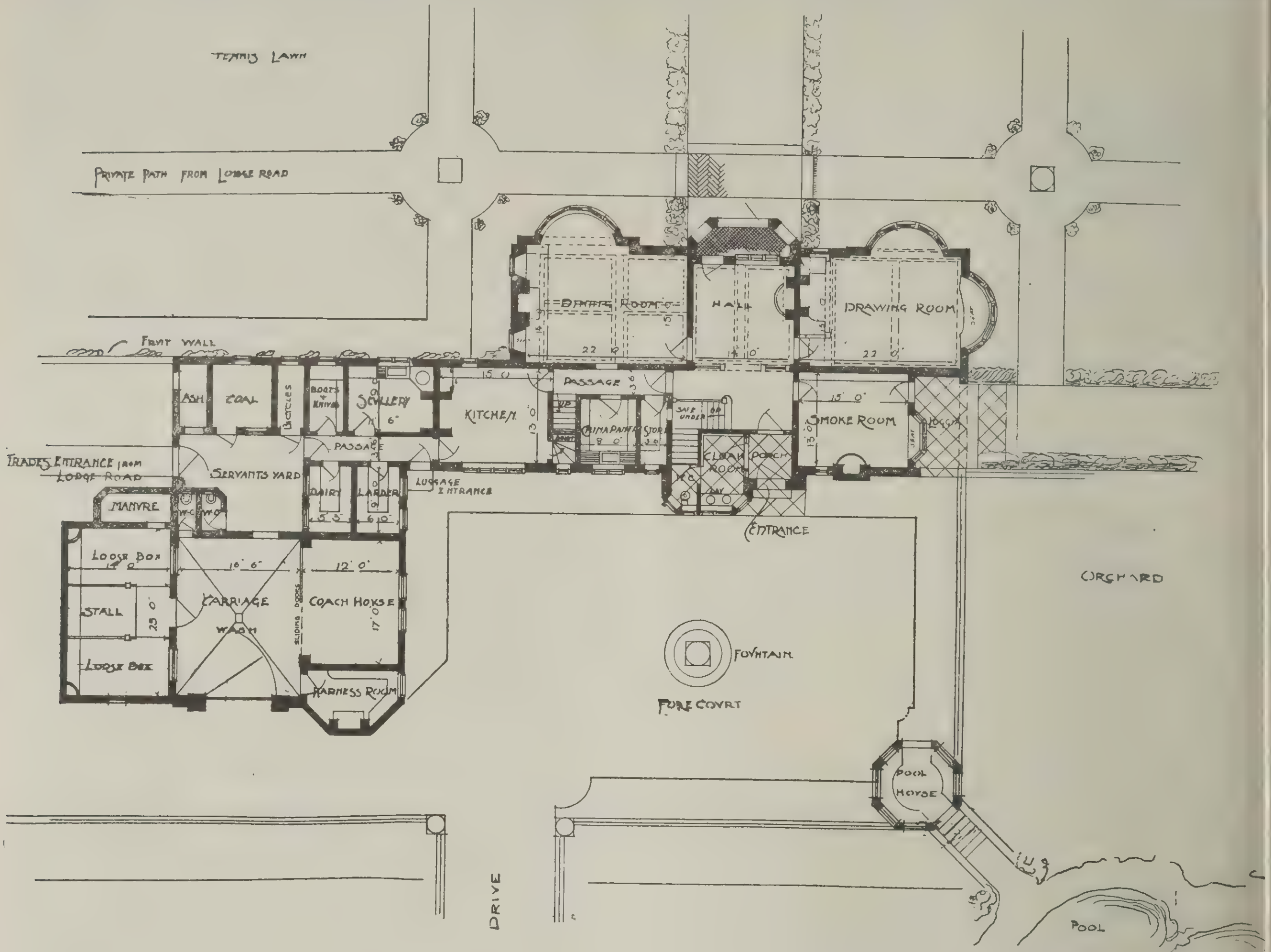
WITH the view we give this week we complete the illustrations of Exeter College in our Oxford series. The first of these, with a historical account, appeared in our issue of April 22.

### THE DIVINITY SCHOOL, OXFORD.

THE Divinity School was commenced in 1445. It was not, however, until 1480 that the School together with the first University Library was removed from the Old Congregation House to the present building. The reason for this long interval was that the men were taken away to complete the works being carried out at Eton and Windsor under WILLIAM OF WAYNFLETE, Bishop of Winchester, Provost of Eton, founder of Magdalen College, and Lord Chancellor. The Divinity School occupies the ground floor of the building erected by HUMPHREY, Duke of Gloucester, son of HENRY IV., to accommodate his handsome donation of 600 books to the University. It was this generosity on the part of the Royal patron of letters that resulted in Oxford's most cherished possession, the Bodleian Library. At the time of its completion the School was conspicuous for its stained glass as well as for the splendid groined roof. The large and beautiful Late Perpendicular windows were chiefly filled by representations of the Holy Fathers of the Church and the armorial bearings of about a hundred benefactors. These a short half-century later shared the fate of HUMPHREY's precious MSS., and were ordered by the Commissioners of EDWARD VI. to be destroyed as partaking of the specious and superstitious doctrines of Rome. The fittings of the interior were broken up and the lead from the roof was pillaged. Nettles and brambles flourished in crevices in the walls, while a cattle pen and a timber yard were set up close by. On September 30, 1555, Bishops RIDLEY and LATIMER were tried with CRANMER by special commissioners, and were convicted of heresy. In the same year Convocation determined to sell the remaining statues and fittings. Fortunately the groined roof was preserved more or less unharmed.

In 1598 Sir THOMAS BODLEY tired of the wiles of diplomacy, and sought for and obtained permission to rebuild Duke HUMPHREY's library. In 1625 Oxford was once again honoured by Parliament meeting in the Royal city for a few days, though on this occasion it was only on account of the third outbreak of plague in London, when there were 35,417 deaths. The House of Lords sat in the north end of the picture gallery in the Bodleian Library, the Privy Council assembled in Christ Church Hall, and the Commons in the Divinity School. During the Civil War and siege of Oxford the school was used in common with other collegiate buildings as a storehouse for corn and provisions for the troops. The upper room of the tower was filled with muskets.

In 1699 WREN prepared a report of the necessary repairs, and the document is now—or at any rate was—in the Bodleian Library. It appears that there was a crack in the roof, the south wall bulged, and the floor was rotten. He advised that the building should be braced with iron after the style he had carried out on the spire of Salisbury Cathedral when that edifice was struck by lightning. Additional buttresses of great strength and depth were erected on the south side. This work was completed in 1700-2, and the building was successfully restored.



JOB'S CLOSE, KNOWLE, FOR HAROLD HASLUCK, ESQ.—Messrs. HICKTON & FARMER, Architects.

Mr. FRANCIS BOND, speaking in his "Gothic Architecture in England" of the timidity shown by some of the pioneers in fan vaulting, points out that one of the signs of distrust was the construction of massive transverse arches passing up the centre of each half conoid and spanning the nave. "The suggestion of these transverse arches," continues Mr. BOND, "seems to have come from Oxford, where they were employed in two superb lierne vaults of novel character. The first is that of the Divinity School, begun *c.* 1445 and finished *c.* 1480. It is a long and very broad room. The obvious way to vault it was to divide it into nave and aisles and then to ceil these with three vaults, *e.g.* as in the choir of the Temple Church. But the eight piers would have been obstructive; moreover, there would have been no credit to be got for merely repeating what had been done before in scores of churches. Imagine, however, that it had actually been vaulted in three divisions of nearly equal height, and that each of the piers carried a capital. Would it be possible to retain the capitals, while withdrawing the piers, without bringing the three vaults down? What would a modern contractor do if he were asked to leave the vaults of the Temple choir standing while withdrawing the supports? Obviously, from a point in one wall to a point in the opposite wall he would insert an iron girder, and if this (transverse) girder passed under the capitals of the two piers he could then take away the piers. So with the other piers. What a modern contractor would do with iron girders, that the Oxford builder did with strong transverse arches of stone. The pendants of each transverse arch, which represent the imaginary capitals, are but two of the voussoirs of the arch greatly elongated. This beautiful novelty was imitated soon after in the vault of the cathedral choir."

### ROMSEY, FARNHAM ROYAL.

THIS house was erected in 1906 from designs by Mr. A. E. BULLOCK, A.R.I.B.A., on a triangular field having an axis of the lower road running centrally through the house. The centres of each room will be seen to meet in the hall. The hall chimney-piece and ingle was made by Messrs. HOFLER & Co. in oak. The builder was Mr. BOWYER, of Slough. The materials are local red bricks and tiles with rough-cast to first floor. The verandah was added before completion and has materially added to the effect. The axial system of garden planning was not adopted. This radial form of plan was suggested by the very difficult aspect, and sunlight could not have been obtained adequately by other means.

### HOUSE IN EDGBASTON—INTERIOR VIEWS.

THESE illustrations are characteristic of the simple and effective treatment of interiors to be found in the designs of Messrs. FORBES & TATE.

### JOB'S CLOSE, KNOWLE.—GARDEN FRONT—ENTRANCE FRONT.

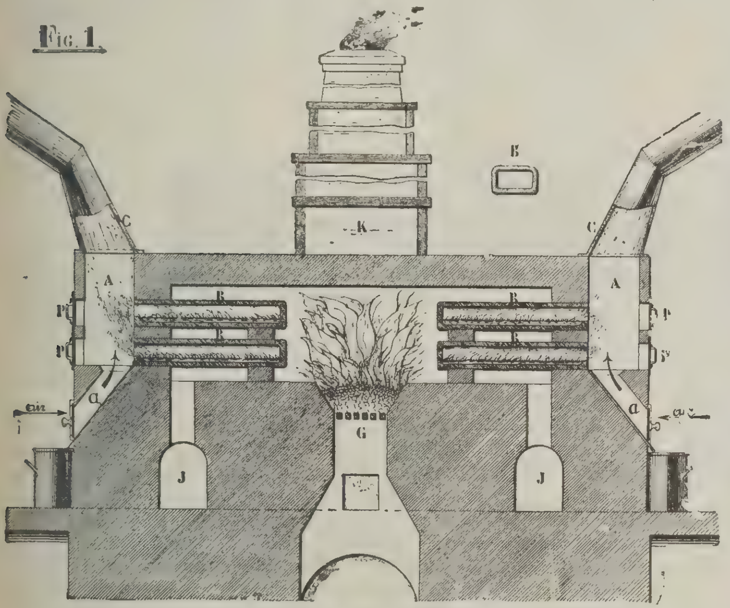
THIS house has been built for HAROLD HASLUCK, Esq., at a cost of about 4,000*l.*, from the designs of Messrs. HICKTON & FARMER. As will be seen from the illustrations and plan, the lay-out of the grounds has formed an integral part of the architects' designs.

THE Glasgow School of Architecture began six years ago, when the separate architectural courses of the Technical College and the School of Art were amalgamated, a joint diploma course, which is the highest in the school. Its final stage is the submitting of an original design and relative details with proof of full qualification for professional practice. Four of these diplomas—Dip. Arch. Glasgow—the first in Scotland, have just been granted to Mr. Alex. Adam, Churchill House, Paisley; Mr. Walter Alexander, 29 Westbourne Gardens, Glasgow; Mr. Thomas A. Macadam, 6 Knowe Terrace, Cathcart; and Mr. Charles A. Harding, 46 Kersland Street, Glasgow.

## ZINC OXIDE.[*]

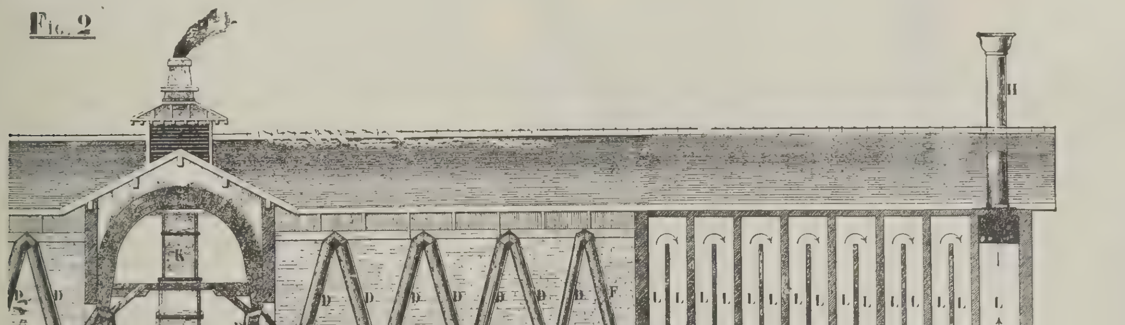
Amongst the many pigments used in the manufacture of paint few—if any perhaps—are at the present time more interesting than zinc oxide (ZnO). We have to look back nearly a century and a half to find the first attempt to discover a white pigment capable of taking the place of the poisonous white lead. It was in 1750 that the French chemist Courtois and his collaborator, Guyton de Morveau, stimulated solely by philanthropic motives, attempted to introduce ZnO as a substitute for white lead, which already in those days was admtted to be a scourge amongst lead workers and painters. The first successful use of ZnO as a paint pigment must, however, be attributed to the persistent efforts of Jean Leclaire, who began to manufacture and use ZnO in a small way in 1785. Since then steady progress has been made, and to-day I may say that zinc oxide is regarded with widespread interest, not only amongst paint manufacturers, but also amongst paint users and painters.

Fig. 1.



The output of ZnO factories is yearly increasing, and I have no hesitation in saying that it will very soon surpass—in fact, leave a very long way behind—that of the white lead factories, especially if, following the good example of France and other countries, the manufacture and use of white lead is prohibited by other Governments having at heart the health of the workers.

Fig. 2



*Processes for the Manufacture of Zinc Oxide.*

I am distinguishing the processes which are now actually in use from those which are still in the experimental stage. Process in actual use:—

### 1.—*The Indirect Process.*

This method consists essentially in burning the vapours of zinc in a current of air. The particles of oxide formed are carried in this current of air and collected in depositing chambers or tubes. This process I call "indirect" because it is necessary first of all to extract the metallic zinc from the ore, and then transform the metal into oxide. The "raw material" consists of zinc ingots weighing approximately 10 kilos., equals 22 lbs. (see specimen). These ingots are obtained by the mixture of various qualities of the metal, hard spelter, No. 2 zinc, residues obtained from galvanising liquors (see specimen), old zinc, &c. Naturally the proportions of the different constituents vary according to the quality of zinc oxide which it is desired to obtain.

*Description of the Apparatus* (see Plans 1 and 2).—The metal in blocks is introduced into retorts made of refractory earth B (plan 1), having the shape of very flat semi-cylinders ending on the side of the opening with a salient return intended to prevent the overflowing of the molten zinc. These retorts are heated in a grated oven which can accommodate twenty retorts, placed right and left on two rows, one above the other. The same furnace (G) heats the two series of ten retorts, and the gases from this process are liberated in the chimney (K) by the opening JJ. When the retorts are carried to a red white heat, the zinc oxide distils and the vapours are given off in the little chamber A. The loading of the retorts is done by means of two doors, which are found in the inner walls of these chambers. A current of air is forced by a fan (not shown here) into the chamber A through a slightly inclined conduit *a*. The zinc vapours burn in contact with the air and the oxide is carried away by the air-current in the condensing apparatus, to which I will refer later. The metal which has escaped oxidation falls back in small drops into the conduit *a*, at the extremity of which it is collected mixed with a certain quantity of oxide of zinc.

The chamber (A) is covered by a large tube (C) which constitutes the first elements of the condensation apparatus (C). In the conduit *a* is to be found metallic zinc, zinc oxide pure and agglomerated, and pulverulent oxide. From it a greyish white is obtained, which is sold under the name of "grey zinc." The zinc oxide carried away in the tube C (plan 2) goes into a series of iron cooling tubes (DDD) turned down syphon shape, terminating into hoppers (EEE), lengthened by a sheet-iron tube, ending in a linen bag which can be opened at will, and is used to collect the deposited oxide. The zinc oxide then arrives at tube (F) and penetrates into the condensation chamber (L). These chambers are divided into vertical partitions covered with fluffy cotton in a series of compartments terminating in a hopper (T) with a linen bag extension. Each compartment is itself subdivided by a vertical partition so arranged as to force the gases to go up and down before entering the neighbouring compartment. After having travelled through these compartments the gases pass through a metallic cloth, and practically freed from every particle of zinc oxide pass into the large chimney (H). The zinc white collected in the first part of the cooling chambers is pulverulent and of a higher density than the oxide deposited further on, which is light, flaky, and impalpable. The first constitutes the blue and red seals, the second the green and white seal, the lightest and whitest being collected near the draught chimney, the density increasing and the whiteness decreasing in proportion as they recede further from the draught chimney. This system of collection is called "collection by deposition," and is characterised by the absence of the large filtering sacks, of which I will make mention later on. Concerning this process, I propose to give a few figures which will, no doubt, prove of interest. The temperature at which zinc oxide volatilises being 1,900° Fahr., the temperature of the furnaces often exceeds 2,375° Fahr. The inside dimensions of the retorts are 1,060 mm. long, 320 mm. wide and 100 mm. high. The opening which is used for the introduction of the zinc ingot, as well as for the escape of the zinc vapours, is 240 mm. wide and 40 mm. high. The returns of this process theoretically calculated amount to 125 per cent., i.e. one ton of pure zinc gives in theory $1\frac{1}{4}$ tons of zinc oxide, but in practice, in consequence of inevitable loss and unavoidable impurities in the raw products, the returns vary from 110 to 115 per cent. A double furnace containing 40 retorts burns 12 tons of zinc in twenty-four hours and produces 13 to 14 tons of zinc oxide, the consumption in coals being approximately 40 to 45 kilos. per 100 kilos. of zinc. Consequently the retort will burn 300 kilos. of zinc in twenty-four hours, each loading being 20 kilos., showing an average of fifteen loads in twenty-four hours.

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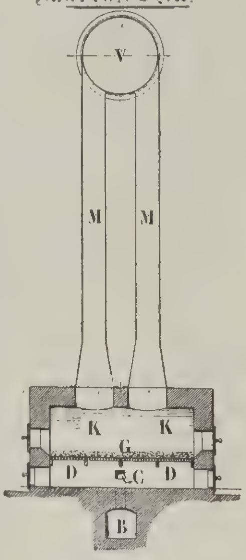
[*] A paper read on May 12 before the Paint and Varnish Society by Mr. Gaston Depièrres.

Fig. 4.

SECTION - Q.R.



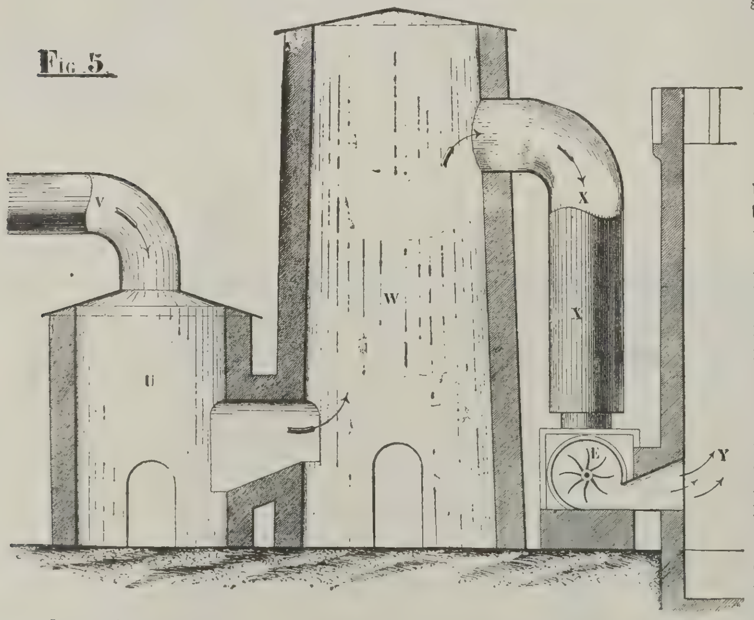
As you will see this operation is a continuous one, and when the zinc of any one retort is used, a fresh quantity is introduced without having to put out the furnace, which remains alight for several months. The retorts last from eight to ten days according to quality, taking into consideration the composition of the zinc, and the way in which the stoking of the furnace is carried out.

The zinc oxide manufactured by this method undoubtedly varies according to the raw material employed and the oxides obtained are composed on an average as follows:—

ZnO, 98 to 99.50 per cent.

Pb (as oxide, carbonate sulphate or sulphite), 0 to 1 per cent. The rest is composed of very small traces of other metals, such as Cd, Fe, Sb, moisture, carbon, anhydride, chloride, foreign matters, &c.

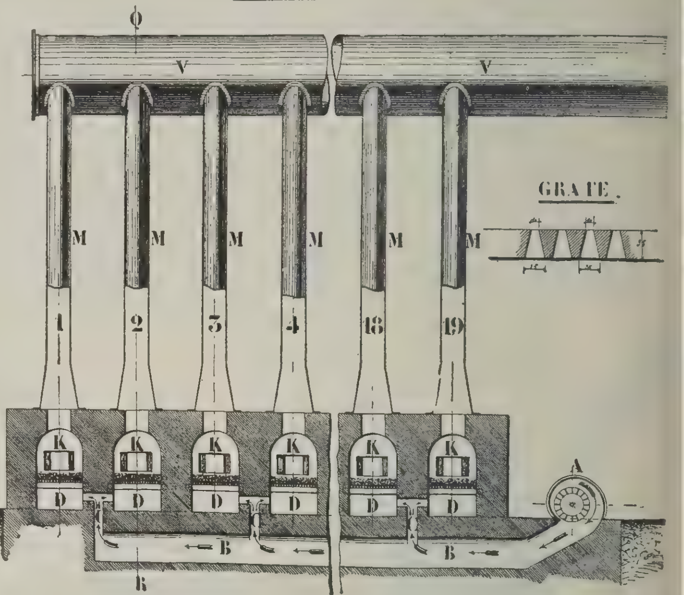
Fig. 5.



2.—*Direct Process.*

I call this process "direct" because the ZnO is obtained straight from the ore without passing through the metal stage. The ores suitable for this method—of which I will speak later on—are oxidised zinc ores which answer more or less, theoretically speaking, to the chemical formula ZnO containing certain proportions of iron, manganese, lime, silicate, &c. Plan 3 and 4 represents in its "ensemble" a succession of nineteen furnaces. The furnace used is composed of an arched channel (K) with doors (PP), at each end of which there is a grate of special design (G) (see plan 3 and 4). This grate consists of a cast-iron plate 35 mm. thick, perforated with conical holes having the narrowest extremity (10 mm. in diameter) turned upwards, whereas the wider opening of the cone is turned downwards. It will readily be seen that owing to this disposition of the grate the obstruction of the holes is impossible.

Fig. 3.



As I will explain to you later, the ore and coals are thrown on the grate (G) through doors (PP); below the grate is a closed cinder box (D) into which a current of air is forced through the passage (B) by means of a fan (A). This forced current of air penetrates the cinder box, through the small conduit (CC), which can be closed by means of registers to shut off the current when the work is finished. From the channel (K) the gases pass into ascending tubes (M), and then into collector (V). The width of the oven is 900 mm. on a level with the grate length, 4,600 mm. height from the highest point of the arch above the grate 900 mm. The doors are mounted in frames 300 mm. high and 800 mm. wide; these dimensions are only approximate, as I know they vary from one factory to another. From the collector (V) the gases, which are charged with white dust and various vapours, pass successively into two brick towers (U and W), plan 5, where the zinc fumes which are not thoroughly oxidated continue to burn, and the particles of cinder and coal are carried away and fall to the bottom. The gases are then taken away through the conduit (X) by means of a fan (E) from the tower (W), and forced into the cooling chamber (Y), plan 6. From the chamber (Y), the gases pass into the sack chamber (SS), plan 7. There the oxide of zinc remains in the sacks, whereas the gases go through the meshes of the tissues and escape through the side. The great tower (W) is 21 metres high and 24 metres in circumference at its widest point. The refrigerating chamber (W) is 30 metres long, 6 metres wide, and 13 metres to the top of the arched roof. The bottom is divided into differently arranged compartments (RR), which serve to collect the zinc oxide which has been precipitated.

In certain factories the compartments (RR) are composed of large metal sieves with registers used to collect the product. The sack chamber (SS) is a large building at the upper extremity of which is the metal collector (T); this is 1,800 mm. in diameter. From this collector (T) a series of sheet iron perpendicular tubes form ramifications, to which are attached the long linen tubes, otherwise called sacks. The diameter of the tube is half as much again as that of the sacks, which are 600 mm. in diameter, and from 8 to 10 metres high. The lower extremity of these sacks is shaped like a funnel (see plan 7). From time to time the sacks are beaten to force the zinc oxide through them; these sacks are generally made of coarse cotton or woollen material, which last longer, especially if the gases to be filtered are at a high temperature. It is essential that the building containing these sacks be well ventilated, as an accumulation of gas might cause slight asphyxia to the workmen. As you will see, the system of condensation is very different to the one I described before, the "indirect method." The "direct method" is characterised by the use of filtering sacks, which are becoming of more general use. Some years ago these sacks were not known, and in many factories a very fine spray of water was introduced into the chambers (UVY), which caused the immediate condensation of the oxide. It is generally acknowledged that this process resulted in products of inferior quality called "chamber oxides," and I do not think it is still in vogue in any factory.

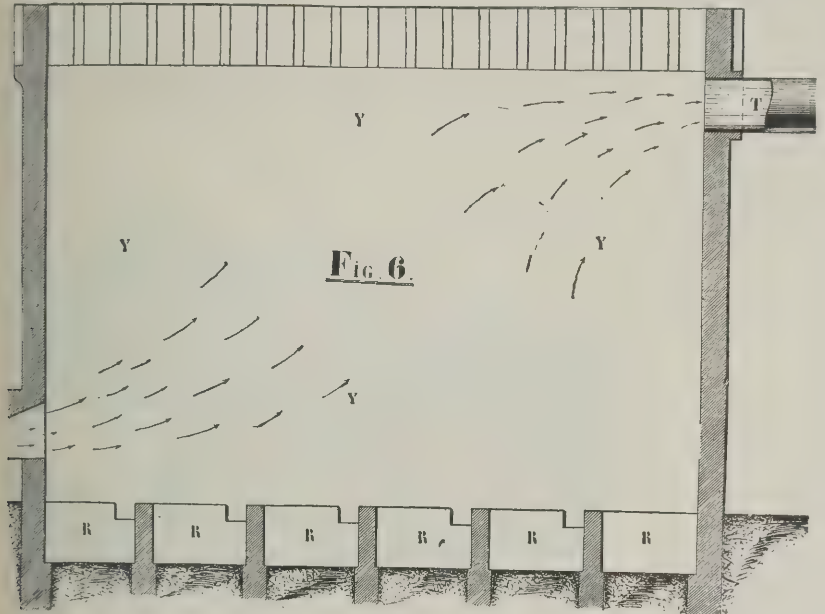


Fig. 6.

*Chemical Examination of the "Direct" Process.*

The manufacture by this method can be divided into three phases:—(1) Reduction and volatilisation of the metal Zn at a high temperature. (2) Re-oxidation of the metal in the form of gas at a slightly lower temperature. (3) Cooling of the gases and condensation of the ZnO. We need now only consider the first and second phases or reactions, the third being known by the description of the apparatus. The two first reactions take place in the channel K (plan 3 and 4), and cannot be very clearly divided. The work is done as follows. The grate (G) is covered with a layer of anthracite, the load weighing from 75 to 90 kilos., the forced draught is then started. When the coal is in full combustion, a layer of a mixture of zinc ore and anthracite is spread upon it. For a furnace, the charge is approximately 225 kilos. of ore mixed with 90 kilos. of anthracite. It will be readily understood that these quantities vary with the composition of the ore. When in full working, a furnace is hot enough after the removal of the first residue to start the combustion of a fresh charge. As will be seen, the process is intermittent, the furnace being emptied after each operation. The air forced in the cinder box (CC), plan 3 and 4, goes through the grate and burns the anthracite, transforming it into carbonite anhydride $CO_2$, which in going through the layer of anthracite is partially reduced to oxide of carbon CO. This gas, as well as the carbon from the coals mixed with the ore, cause the reduction of the ZnO into Zn. Then the vapours of the metal Zn are transformed into ZnO by the oxygen of the air, which is in excess as well as by the carbonic acid gas. The ZnO thus formed is carried away by the air current in the apparatus which I have described before, and is collected in the sacks mentioned above.

(*To be continued.*)

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The Executive Masons' Society of Cape Town have issued a notice advising masons who intend coming to South Africa not to agree with any agent to work for less than 2*s.* 6*d.* per hour, that being the wage in the Transvaal.

## FISHMONGERS' HALL AND ST. MAGNUS THE MARTYR CHURCH.[*]

The Fishmongers' Company existed from very early times indeed. The religious customs of the day rendered the consumption of fish, particularly in Lent, to be far greater per head than it is to-day, emphasising the need for the proper control and regulation of the trade.

The first Charter known is dated 1364, and was granted by Edward III. It confirms the grants immemorially made to the Guild by his progenitors, so that it may be quite reasonably supposed that the Fishmongers' Company dates from the twelfth or thirteenth century. There were numerous confirmatory charters granted by the monarchs subsequent to the one above referred to, and the one upon which the Company at present acts was granted by James I. in 1605.

Originally there were two guilds—one embracing salt fishmongers and the other stock or dried fishmongers. They were fused into one guild or company in 1536 after numerous attempts, and at least one temporary alliance.

The Fishmongers appear to have occupied two quarters of the town, one around Billingsgate and the north end of London Bridge, and the other higher up the stream at Queenhithe, where they spread up towards Cheapside, and we now find a relic in the name of Friday Street where the Friday or fish market flourished. This division was caused by Henry III. forbidding any fishing vessels to land goods except at Queenhithe, in order that his Queen's revenue might increase. Edward I., however, greatly widened this regulation, permitting fish to be landed and sold within the bounds of St. Thomas's Chapel on London Bridge, Baynard's Castle, and Jordan's Quay. This monarch caused the trade to be severely regulated, fixing the price at which fish was to be retailed, limiting the profit of the fishmongers to a penny in the shilling, and forbidding what is termed forestalling, i.e., the intercepting by middlemen of the fishing vessels in their passage up the river and so stealing a march on the market and making what was thus considered an improper profit. No fish was to be stored in London beyond the second day after arrival on pain of confiscation and fine, and holding up in expectation of a better market was forbidden. In 1405 Parliament enacted that anyone who should hinder any fisherman, English or foreign, from disposing of his fish as he might see convenient, should be liable to a fine of 10*l*. Elizabeth, however, 150 years later forbade the import of cured fish, as it was considered far "inferieure to the fysshe taken by Englishmen in the island voyages."

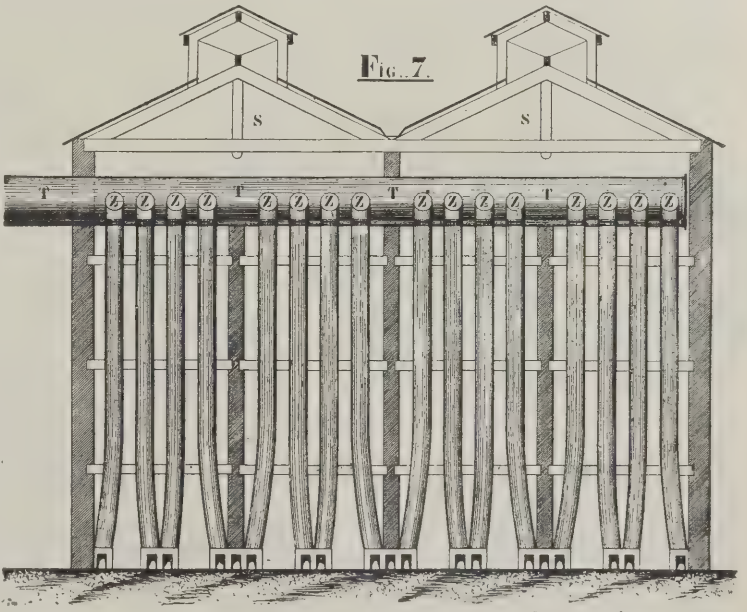
Fig. 7.

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[*] A paper read at a meeting of the Upper Norwood Athenæum by Mr. Frederick Higgs.

The Fishmongers' Company has numbered in its ranks many distinguished persons, Lord Mayors and others, perhaps the most notable having been Sir William Walworth, who in 1381, when at the head of the City's forces, killed the rebel Wat Tyler, when heading a disorganised mob of thirty or forty thousand malcontents from Kent and Surrey. He must have been a strong man and a wealthy, notwithstanding the aforesaid limitation of profits, and comes down to posterity as the chief warrior patriot of the City of London. There was also Sir John Leman, one of the fishmonger Lord Mayors (in 1616). Then we find Doggett, of a numerous family of the name early in the eighteenth century, who hated the Stuarts, and established the coat and badge which is rowed for annually by the Thames watermen between London Bridge and Battersea, the most ancient boat race extant.

Among the treasures of the company are several oil paintings by Beechey, Romney, Murray, Shakleton, Ouless, and others, representing royalty and notables, chiefly within the last 150 years. Also eight sets of paintings of fish by Arnold van Hacken, illustrating all the principal fresh and salt water species. There is also a curious chair and snuff box, made from the woodwork of the foundations of old London Bridge, demolished in 1832, after having done duty for 656 years; it was made and carved by John Ovenston from the design of Sir John Rennie, who constructed the new bridge.

There is also the celebrated Walworth pall, the date of which is doubtful; judging from its design and composition it should be pre-Reformation, but on the other hand the company's arms as worked upon it were not granted until Elizabeth's reign, viz., 1575. It is considered one of the most rare and valuable works of its kind existing. The statue of Walworth is worked in wood and stood in the former hall; it was carved by Edward Pierce in 1698. The dagger in the hand is a modern imitation, but the one preserved in a glass case with the City Arms and those of the company engraved thereon is said to be the original weapon from which Wat Tyler met his fate; it is certainly of that period.

There are busts of the late Queen Victoria and her Consort, of Gladstone, and other statesmen of the last century.

The silver plate possessed by the company is both ancient, numerous and valuable, there being nearly fifty pieces in all, the greater number of which date from the sixteenth and seventeenth centuries. Most of them are beautiful in design and of excellent workmanship. There is also a snuff box made from the wood of a tree under which Wellington stood for some hours at Waterloo, June 18, 1815.

The buildings of the company have, like many other guildhalls, been numerous and varied. Hollar's "View of London," dated 1647, shows the buildings destroyed, like so many others, by the Great Fire in 1666. Little information can be gleaned from this source except that it was a large building of three storeys abutting on the river, partly gabled and partly with embattled parapets, and having a terrace in front with a landing-stage to the river. This structure was replaced by one designed by Mr. Jerman, whom the Drapers also employed, and who designed the Royal Exchange of that day. Like the Drapers' Hall, it was built in quadrangular form, its main front to the river being in the orthodox Classic style of the period after the Great Fire. The interior arrangements are said to have been convenient, spacious, and richly decorated and ornamented.

HOLLAR'S VIEW, 1647.

After 160 years Jerman's building had to come down owing to the alterations consequent on the rebuilding in 1830 of London Bridge 100 feet westward of the old structure. The company employed Mr. Roberts, who certainly produced a dignified and noble building. Like its predecessors it has its river front, but its principal entrance is from the bridge approach. We are greatly indebted to the clerk, Mr. Towse, for his assistance, and to the company for their consent to allow us to see their treasures (a consent most exceptional) and for their kind hospitality.

St. Magnus the Martyr parish church now also serves tw other little city parishes, one St. Margaret's, which formerl stood on the spot now occupied by King William's statue an its surroundings, and another, St. Michael's, Crooked Lane formerly upon the site of the Underground Monument station There are still wardens for each parish, and their ancien wands or staves with their individual patterned tips are stil in use on ceremonial occasions.

St. Magnus's Church was known to exist in 1300. In 130 Hugh Pourt, a London sheriff, together with his wif Margaret, founded a charity in connection with the church The first rector mentioned is Robert de St. Albano, who resigned in 1323. One Yevile was buried here; he was mason t Richard II. and conducted the restoration of Westminste Abbey in 1396. He also founded a charity here. The gift o the living alternated between the abbots of Bermondsey an Westminster. The Crown took it in 1535, but Mary in 155 gave it to the Bishop of London. Arnold's Chronicles, abou 1500, says that "the church was much neglected, the service insufficiently performed, many of the priests and clerks spending the time of divine service in taverns and ale houses, i fishing, and other trifles."

SECOND FISHMONGERS' HALL.

Hollar's picture, 1647, shows a building of nave and aisle with Perpendicular windows to the latter and Decorated clerestory, a square tower at the north-west corner with castellate or embattled parapet. Its history all along is interwoven with that of old London Bridge, the approach to which passe alongside its west end. This building perished at the Grea Fire and was replaced under Sir Christopher Wren in 167 by the structure you have visited to-day. As Wren left it, the north and south aisles extended to the western face of the tower (completed in 1705), which thus appeared to rise from the roof of the main building; but in 1768 when the old bridge was widened and improved the north-west and south-west corners were removed, leaving the tower detached on three sides, thus adding in my humble opinion to its importance and dignity. From 1768 to the opening of Sir J. Rennie's new bridge in 1833 foot passengers were constantly passing under this tower to cross and recross the bridge on its eastern side. After 1833 it has spent a quiet life undisturbed by the eternal roar and bustle of London life and traffic across the bridge, and stands as a monument, and one of the best, of the genius of our greatest Renaissance architect, Sir Christopher Wren, and of his inimitable co-worker, Grinling Gibbons.

The vestries contain many pictures showing both the church and old London Bridge at various periods since the seventeenth century, also twelve chairs and two arm chairs of Chippendale make, and a Jacobean clock, all very rare and valuable. The pre-Reformation plate is almost unique; paten, drinking cups, old spoons, and some Maundy Thursday feet washing dishes. In the church are two very old fire engines said to be 200 years old, an old chest preserved from the Great Fire and bearing date 1614; a framed schedule of the duties of clerk and sexton, and bearing date 1678, is hanging on the entrance screen.

The pulpit presents some beautiful work, particularly the carved enrichments and the panels, the mitreing and inlaying of which owing to the overlay of successive coats of varnish are almost undistinguishable. The sounding board formerly over the top deck has been taken down and is standing in the entrance lobby; it too is elaborately constructed with mitred soffit, also almost undistinguishable for gum. I believe this church is now almost alone in the antiquarian honour of possessing a real original three-decker pulpit.

When Wren erected the buildings the windows on the north side flanking Lower Thames Street were long ones like those on the opposite aisle, but the wardens of the eighteenth century found the task of repairs owing to the damage done by the fish porters of Billingsgate so excessive that they filled up the lower parts, constructing the bullseye windows which now exist.

The reredos and organ front are both splendid specimens of Grinling Gibbons's work, or of the school of wood carvers controlled and inspired by that genius. The reredos picture is either by Sir Joshua Reynolds or by a Dutch artist. The organ was built in 1712 by Jordan, and is said to be the third finest instrument in England. The marble font is a good one and dates from 1683. There is more than one quaint tombstone in and around the church. One to the memory of a sober and temperate potman or bar-tender at the historic Boar's Head Tavern, Eastcheap, Robert Preston by name. There is another commemorating a kinswoman of my own, Amelia Corderoy, who died "a victim to conjugal affection"; but the greatest of these memorials is undoubtedly that of Miles Coverdale, the translator and publisher of the first English edition of Holy Writ authorised by the King. Brought up an Augustinian monk, he was converted to Protestantism and became under Henry VIII. Bishop of Exeter. Deposed by Mary he fled to Denmark, returning on Elizabeth's accession, and in 1563 he was appointed rector of St. Magnus the Martyr.

Among the property held by the parish of St. Michael, Crooked Lane, was the ancient hostelry famous to Shakespearean students as the Boar's Head, Eastcheap. This property was bequeathed somewhere about 1390 A.D. by the then owner, William Warder, to a college of priests founded by Sir Wm. Walworth for the church named The wardens and parishioners used to hold their vestry meetings there, and the bar parlour was doubtless one of the places of resort referred to by Arnold in his Chronicles, which I have already quoted. The immortal bard must frequently have journeyed across from the Globe Theatre over the bridge in Southwark, and enjoyed the revelry often to be witnessed there. Shakespeare must have often seen the iron tobacco box and the gilt goblet which were in use there, and which he mentions, and which are now amongst the most treasured possessions of the church of St. Magnus the Martyr.

One cannot deal with these subjects of Fishmongers' Hall and St. Magnus Church without a short reference in closing to the ancient highway over the river close by with whose fortunes both have been so inextricably connected.

King Ethelred caused a timber bridge to be constructed in 1002, which lasted a century and three-quarters, when in 1176 the monk Peter of Colechurch commenced the structure which in the main existed till 1830, a monument to sound work in bridge building so far as its principles were known in the twelfth century. Peter died in 1201 before completing his work, and one Isembert was commissioned to finish it, which in due course came about in 1214. The whole work thus consumed thirty-eight years. It was built upon platforms of timber constructed on clusters of timber piles. There were nineteen pointed stone arches of various spans, with a drawbridge in the centre, and the whole measured over 900 feet long and 40 feet wide. In one of the spandrils or pocket haunches between the spans a chapel crypt was constructed by Peter with Gothic vaulted roof, carrying the roadway above. It was approached either from the water level upwards, or from the road downwards by winding stairs. It was dedicated to St. Thomas à Becket. At the ends of the bridge there were massive stone gateway structures. Wooden houses were built at frequent intervals along its length, stretching more than the width of the bridge by being bracketted or corbelled over the sides, the traffic passing under the first floors as in a series of tunnels, the lower floors of these houses being utilised as shops with their fronts to the roadway. Fires from time to time destroyed these houses, and they were finally done away with in 1760. The narrow waterways between the pile piers so impeded the tide flow that it was quite an exciting and dangerous experience to shoot the rapids caused thereby, and it is recorded that fifty persons perished yearly from this cause. It was said that "London Bridge was made for wise men to go over and fools to go under."

OLD LONDON BRIDGE, 1756.

By the middle of the eighteenth century the state of the structure became so bad that it cost 2,500l. per annum to keep it up anyhow, and in 1760 to 1768 its repair was taken in hand. Smeaton, of Eddystone fame, being called in to advise, the old houses were swept away, some of the arches reconstructed, the roadway widened as far as might be, and the approaches also, entailing the alterations to St. Magnus's Church west end already noted. This work, however, was only tinkering with the question, and before fifty more years had passed the Corporation determined on a new structure, 100 feet west of the old one, with the result we now know and appreciate as Sir John Rennie's masterpiece.

OLD LONDON BRIDGE AND ST. MAGNUS CHURCH.

London Bridge! Of what scenes of comedy, tragedy, revelry and woe have you been the witness. Now, joyful processions of happy subjects celebrating a monarch's nuptials; now, running red with the slaughter of men, and perhaps women too, rising in protest against injustice and oppression; now blazing with banners and decorations over some Church or State festival; now desecrated or consecrated by the public exposure of the heads of decapitated traitors, patriots, or religious reformers, the victims perchance of prejudice, misunderstandings and bigotry. We live in milder and happier, if more strenuous times, and the countless throngs who pass to and fro all day and every day are mainly concerned as to how to earn their daily food and do their daily duty, holding whatever beliefs and opinions they may upon religion and politics without let or hindrance, no man making them afraid. "Think and let think," "Live and let live." May the Victorian traditions long continue the ruling spirit in British life and politics.

## GROUND PLAN OF LONDON.

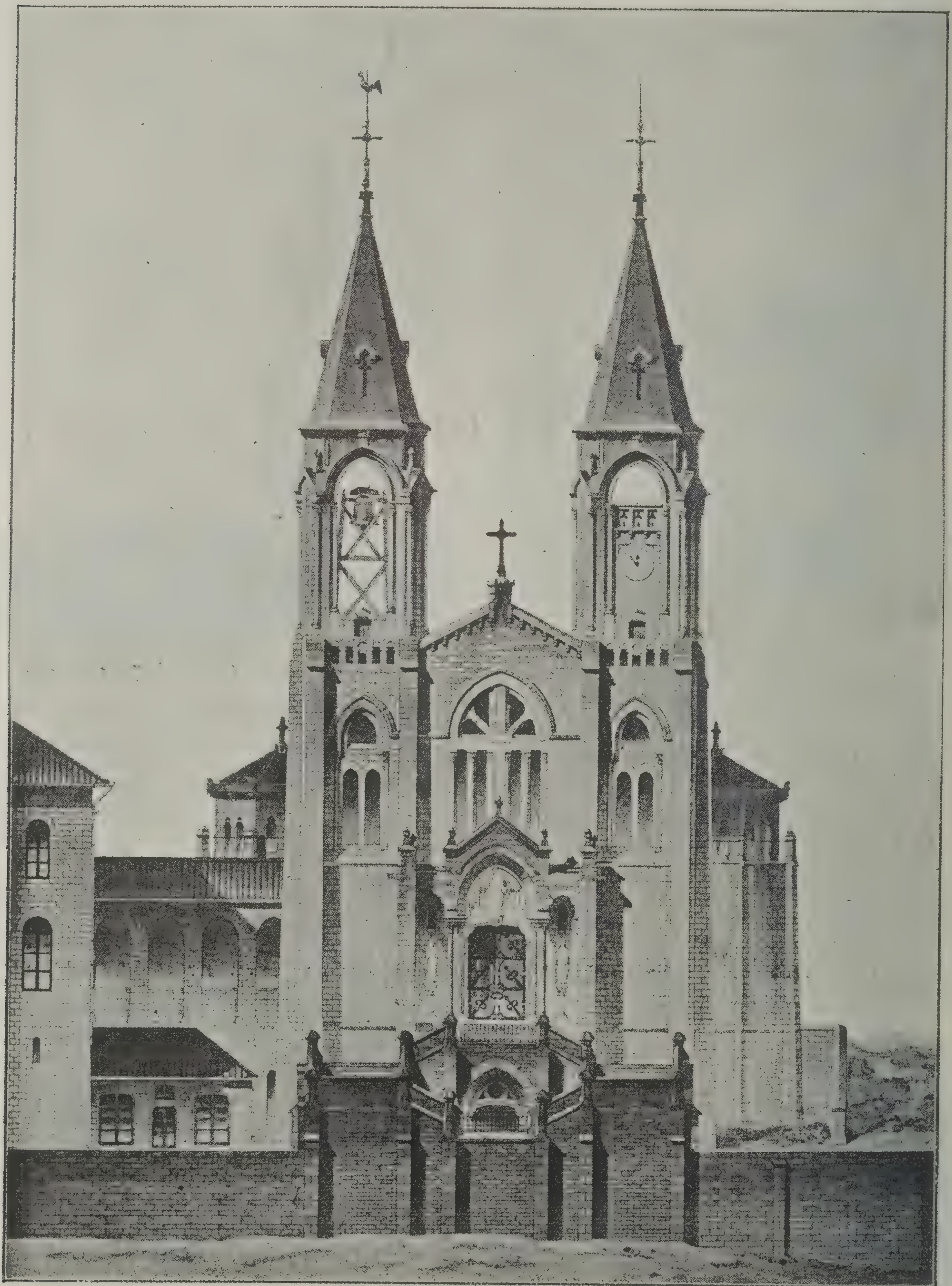
THE Local Government, Records, and Museums Committee of the London County Council has reported as follows:—

The Council on March 13, 1894, decided to prepare, for its own use, a ground plan showing the various freehold ownerships in the County of London. This course was taken in view of the fact that great difficulty had been experienced in ascertaining the ownership of property affected by street improvements and other schemes. The plan consists of ownership and detail sections, and is being prepared by the valuer. The ownership section consists of defining estate boundaries and registering the names and addresses of the owners or their agents, and the detail section of the work consists in the keeping up-to-date of the existing five-feet ordnance survey.

As regards the ownership section of the plan, the Council has sanctioned a total expenditure of 16,650l. in respect of

## MODERN EUROPEAN ARCHITECTURE.

### FRENCH WORK IN PALESTINE.



[From *La Construction Moderne*.

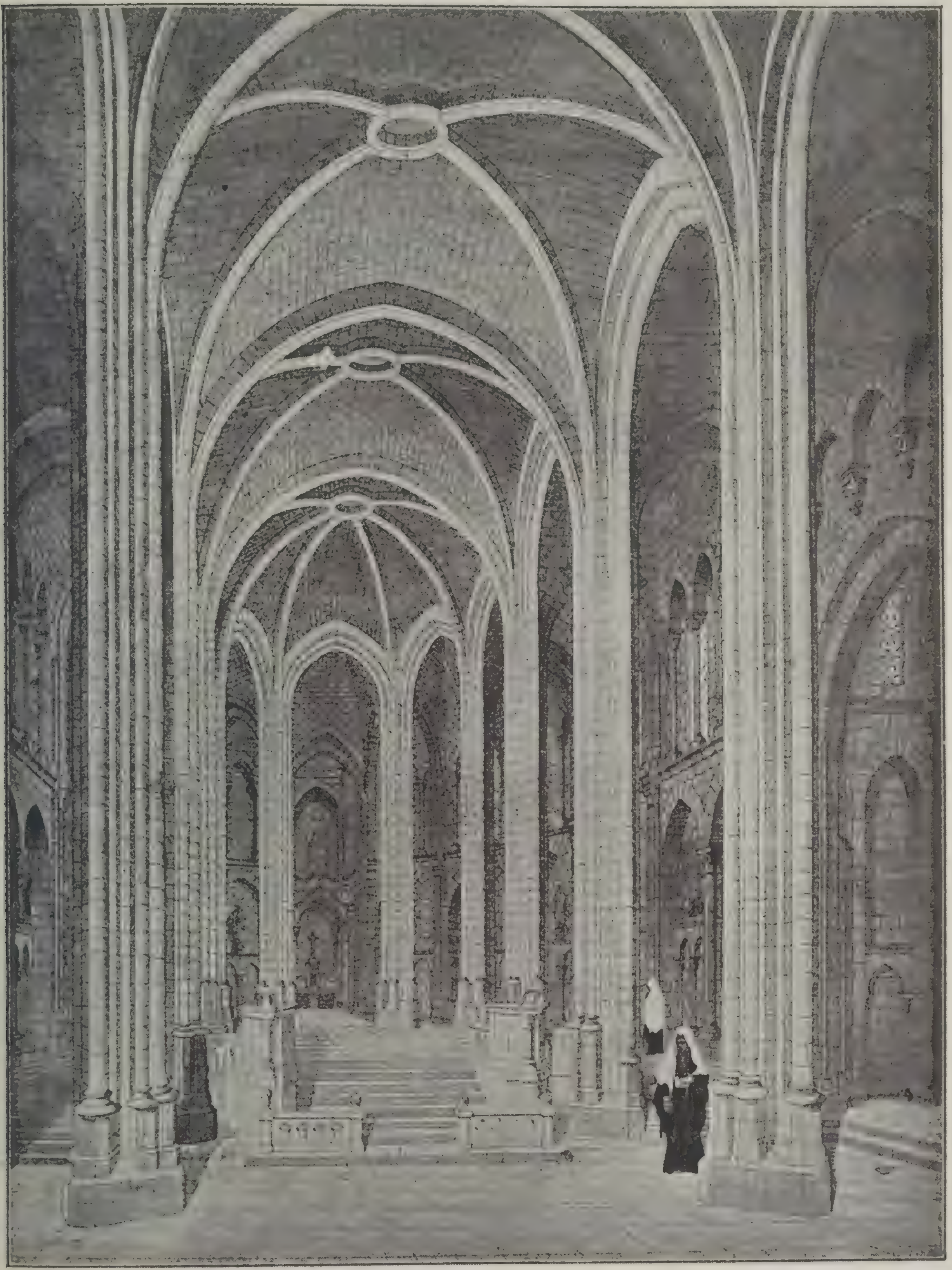
BASILICAN CHURCH OF JESUS ADOLESCENT AT NAZARETH.—M. L. GAUTHIER, Architect.

the work, and the valuer has assured us that the advantage derived from the possession of the information which has been collected has resulted in a saving of more than the sum spent. The work has now been completed, with the exception of an area of about 1½ square miles, in respect of which considerable difficulty has been experienced in ascertaining definite particulars as to ownership. Information as to these estates will probably be obtained from time to time. Up to March 31, 1910, the total cost of the work amounted to 16,634*l*. 8*s*. 5*d*., or 3,366*l*. less than the valuer's original estimate of 20,000*l*.; and the area of the estates drawn on the plan was 114 square miles 70 acres, representing 35,700 estates.

In the preparation of this section of the ground plan the 25-inch ordnance sheet has been used, and this size has been found suitable when defining the larger estates, but when dealing with the smaller estates, of which there are a large number and over 8,000 consisting of only one house, the 25-inch scale has been found too small. The wear and tear of fifteen years' work on the plan has, moreover, rendered it

## MODERN EUROPEAN ARCHITECTURE.

### FRENCH WORK IN PALESTINE.



[From *La Construction Moderne.*

BASILICAN CHURCH OF JESUS ADOLESCENT AT NAZARETH.—M. L. GAUTHIER, Architect.

necessary, on account of the dilapidated condition of the majority of the sheets, that a new copy should be made. We are satisfied that the re-drawing should be done on ordnance sheets of the 5-feet scale, which will allow of a larger reference number, thereby facilitating reference and expediting the work of re-drawing and prolonging the life of the plan. We also consider that a new index should be prepared. In addition, while the fair copy is being made, a complete revision of the changes in ownerships will be undertaken, thereby rendering the work more valuable as a means of reference.

To carry out the work above-mentioned, it will be necessary to retain the services of most of the staff who have been engaged on the ground plan during the past year, and a sum of 1,865*l*. has been included in the estimates for the current financial year for the purpose. Twenty assistants were employed in the year 1909-10, but it will be sufficient for the services of fifteen to be retained for 1910-11. When the plan has thus been revised, it will still be necessary to keep it up-to-date. We will report at a later date as to the cost of this, but it will probably be found that about half the number of assistants now proposed to be retained will suffice for the work. We have communicated with the Establishment Committee in regard to the employment of the assistants required during the year 1910-11.

## LETCHWORTH'S EXPERIENCE OF TOWN PLANNING.*

I HAVE been asked by the National Housing and Town Planning Council to contribute a few words written from the point of view of Letchworth Garden City, and of the experience gained there. I very gladly consent to write on the subject, though I fear that my words will chiefly be engaged in raising questions rather than in solving them. It may, however, be pointed out that the absence of theoretical solutions has not prevented a very considerable measure of practical success.

At Letchworth we have had in the main two problems to solve:—

(1) The laying out of a town in open order; and

(2) The means whereby the town could be created, in other words—how to attract industries by which people could earn their living.

As to the first, the town we have laid out stands on land which was previously agricultural, almost entirely free from population, and almost free from any existing roads. At Letchworth, in fact, we began as near a clean sheet as anybody is likely to begin with in this country. Nevertheless, the details of this problem were in many respects the same with us as in other instances of town planning. Having agricultural land at nearly an agricultural price, we were able to make a greater point than other towns of building in open order, with gardens and abundant open spaces. Our experience has very clearly shown the possibility and great advantage of forming beforehand a very clear plan of the method of development, and the great advantage of such a plan, and of the methodical laying out of roads and open spaces, of assigning special positions for the factories, of establishing gas and water works, and of carrying out drainage before the population had come to make such works imperative and costly.

We have had to consider the problem of the separation of classes into different parts of the town, and here it has been necessary to take a middle course. Theoretically one would have liked to see no separation of classes in the town; practically, the factory workers and the villa residents have inevitably gravitated to different quarters—the one seeking cheapness and nearness to their work, the other seeking quietness and pleasant views and other advantages for which they could afford to pay. Nevertheless, the separation is by no means complete. There is very much less of it than in an ordinary town.

One great difficulty which confronts us all the time, and with which we are grappling more or less successfully, is the heavy expense of the open order system of development. If you have 10 houses to the acre instead of 40, your roads and sewers, gas and water mains, street lighting, road repairs, and other items, cost you about four times as much per house as they otherwise would. This, of course, is a very serious matter, and in the development of our town we are constantly striving to economise road frontage, so far as that is possible, without reverting to the old system of crowding many houses on to the acre.

But it is in the second problem of attracting industries that the most valuable experiences of Letchworth are being gained. To create a new town, you need, of course, industries, and that means factories. Factories are all the time moving out of great cities, and especially out of London, on account of the high rates and rents, and of the darkness and dirt. Our object has been to methodise this exodus, and to get these factories that move out to come to a new centre, where they will have all possible advantages for carrying on their work cheaply In this we have been successful to an extent that many prophesied to be impossible. We have been successful by giving ample sites at low rents, cheap gas and electrical power, direct connection with the railways, and, of course, freedom from interference; formally the power to prevent any nuisances caused by the factories of the town is being reserved, but in practice it has never once been found necessary to use such powers, because no nuisance has ever arisen. Nevertheless, there are difficulties that make it ten chances to one whether a new centre such as ours can catch any particular industry that is moving out. Some manufacturers must have water carriage, some two or more railways competing for their custom, some will only build on freehold land absolutely free from conditions, and, of course, our land has hitherto only been offered leasehold. Others, again, though they might be willing to take leasehold land from an ordinary landlord, are afraid of collective ownership of land, and indeed have a general idea that a new town is an unsaf place for people of staid and well-tried opinions and principles.

Then, again, it is the light industries that can mos easily be moved out of the great cities; these employ women' labour chiefly, while the heavy industries employing men are much more likely to be obliged to go to tidal water or the coal fields. In spite of all these difficulties, we have got and we are getting, industries. We have already some 20 factories and workshops, employing about 1,000 people on the estate. As time goes on, and town planning, and perhap other forms of regulating the use of land in the common interest, spread more and more, it will be less easy for manufacturers to move their factories to some spot where they will have, or hope to have, complete liberty to do as they please. This liberty, as I have shown, is really for practica purposes no greater than they get in a Garden City such as Letchworth, and it is often accompanied with uncomfortable demands upon the manufacturers for high prices when they need additional land for extensions or for housing.

I said I should raise more questions than I should attempt to solve; we are, however, solving them as we go along at Letchworth. Every extension of town planning in other centres will help us by putting them more nearly on the same footing as we are. Moreover, now that we have a nucleus of 6,000 people, and so many manufacturers, the fear which some have had about supply of labour, about associating themselves with a novel idea, cannot but grow less and less.

---

* A paper by Mr. Aneurin Williams, chairman, First Garden City, Ltd.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has rather a mixed number of illustrations and so gives a fair impression of the many-sidedness of modern American architecture. The Hudson City Savings Institution, by Messrs. Warren & Wetmore, is a mixture of Greek Ionic and Italian Renaissance detail. A mausoleum at Salem Fields Cemetery, Brooklyn, is a study in Egyptian detail and a successful one. Three small suburban houses are fairly respectable, but to balance them there are three small town houses not calculated to give joy. The first of a series of articles on "The Origin and Development of Furniture," starting with Assyria and Egypt, gives promise of interest and thoroughness.

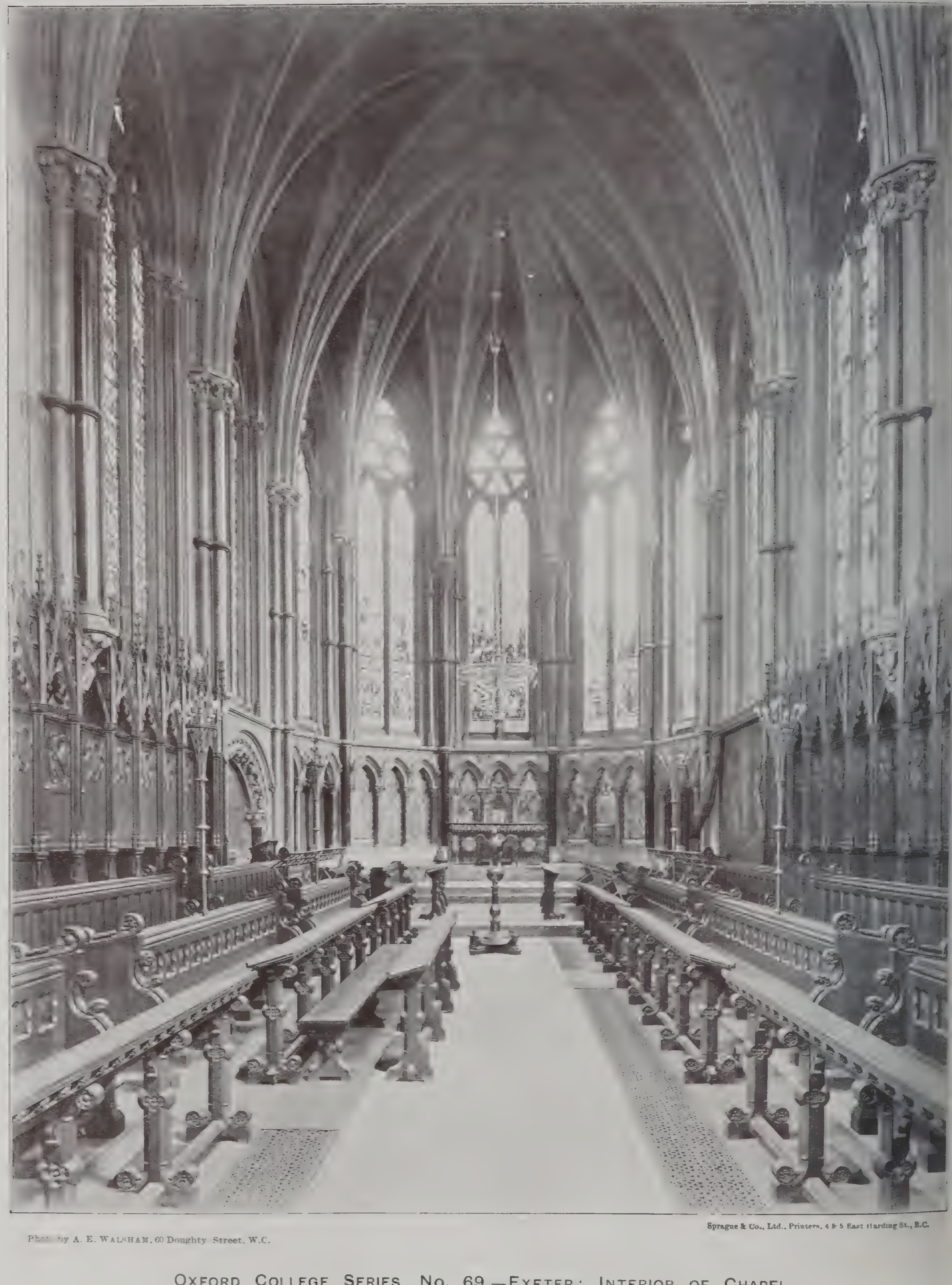
*La Construction Moderne* (Paris) illustrates a quite satisfactory block of flats at the corner of the Avenue Elisée Reclus and Rue Marinoni by M. O. Lambert, and a clever but rather weird clock-tower at Jerusalem over the Bab-el-Khalil Gate by M. P. Séraphin.

*Moderne Bauformen* (Stuttgart) is chiefly occupied this month with the work of Dresden architects and other artists, the most important series of views being of the Munich University building, by Herr German Bestelmeyer. This though mainly on "new art" principles includes an eclectic commingling of historic detail of various periods for its basis of design. A remarkable series of wooden galleries in the cathedral church of St. Peter, Bautzen, is the work of architect Fritz Schumacher and sculptor Karl Gross. Several examples of cemetery architecture are included and some effective houses at Mannheim and Zittau, these with other smaller items making quite a good number.

*Construction* (Toronto) preaches a sermon on "Terra-cotta in Residential Work," advocating the use of hollow terra-cotta blocks in lieu of clapboarding and wooden shingles. The use of the material is illustrated by numerous examples in which the finish is usually rough-cast. As a contrast and showing the possibilities of terra-cotta the Ospedale Maggiore at Milan is illustrated by some excellent photographs. The Toronto General Hospital, which will cost two and a half million dollars, is described and illustrated. Messrs. Darling & Pearson are the architects.

The Institution of Civil Engineers.—In consequence of the death of His Majesty King Edward VII. the Council have decided not to hold their annual conversazione this year. The eighteenth "James Forrest" lecture will be delivered at the Institution on June 22, at 8 p.m., as already announced.

Workmen are putting in the foundations for the proposed new south transept of Selby Abbey. The original structure was demolished by the fall of the tower in 1690. Mr. William Liversedge, a local magistrate, last week announced that he would give the sum of 1,000*l*. towards the cost of rebuilding the transept, in the hope that the matter will be taken up by the public as a memorial to King Edward VII.



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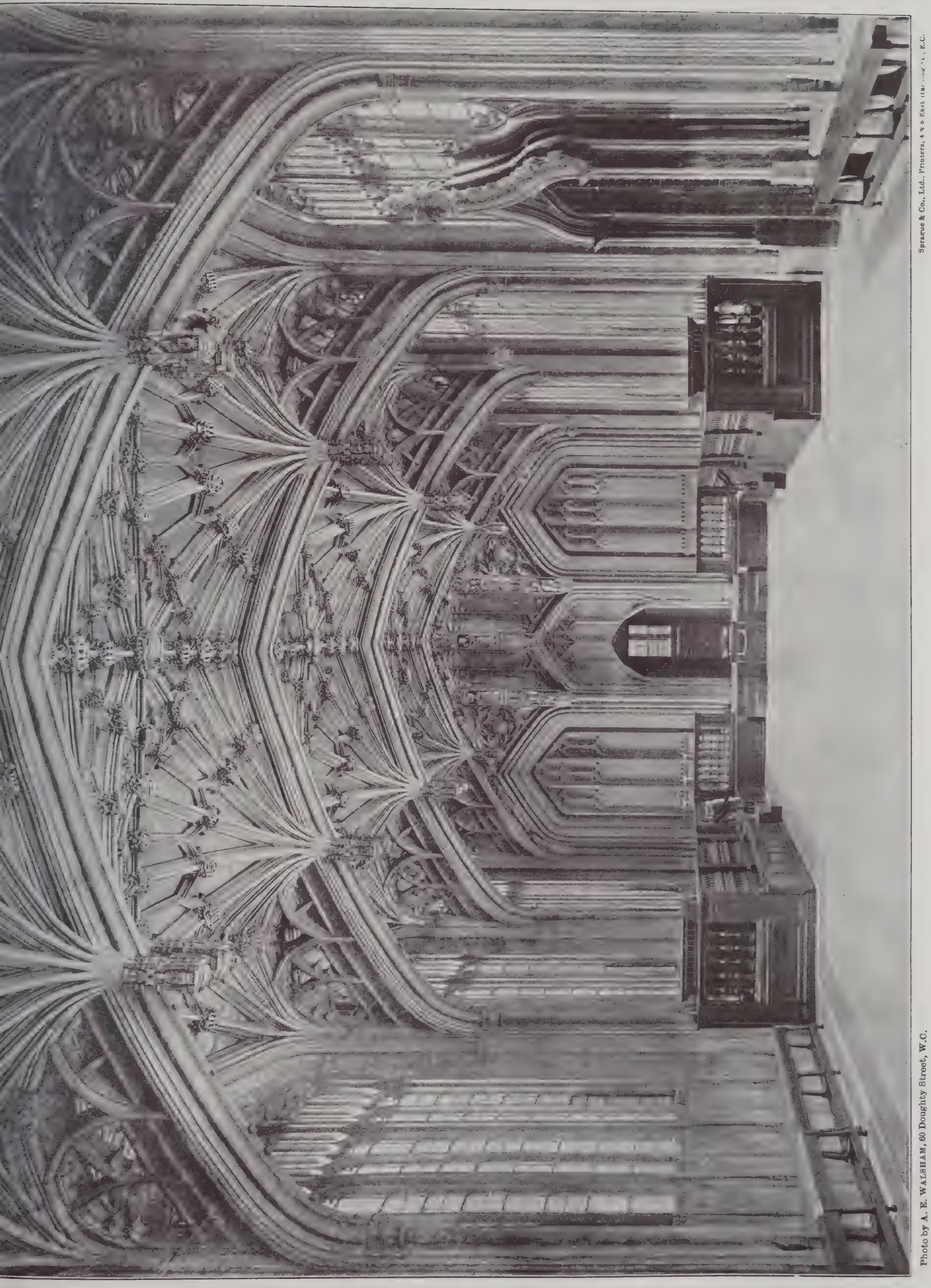

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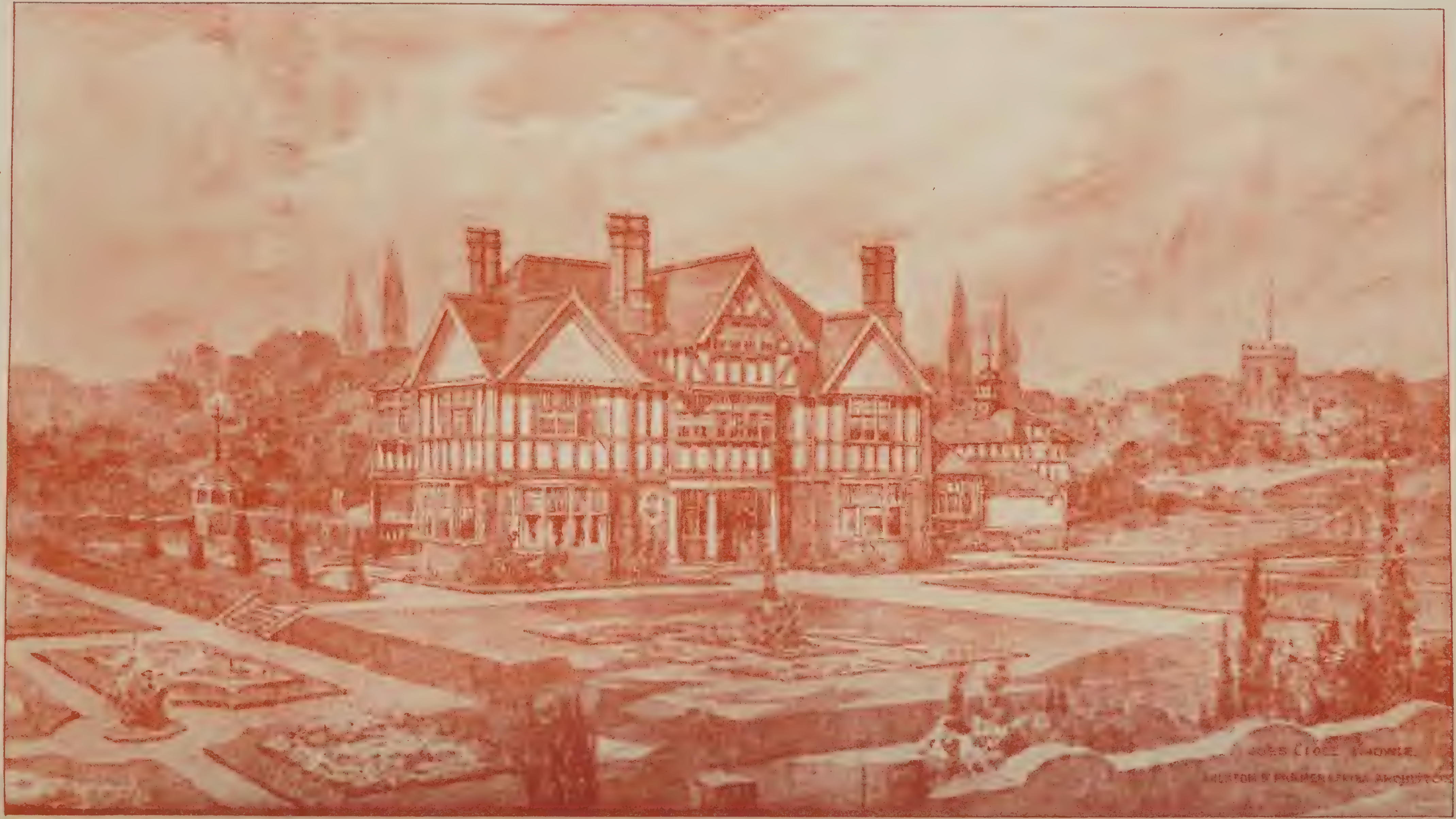

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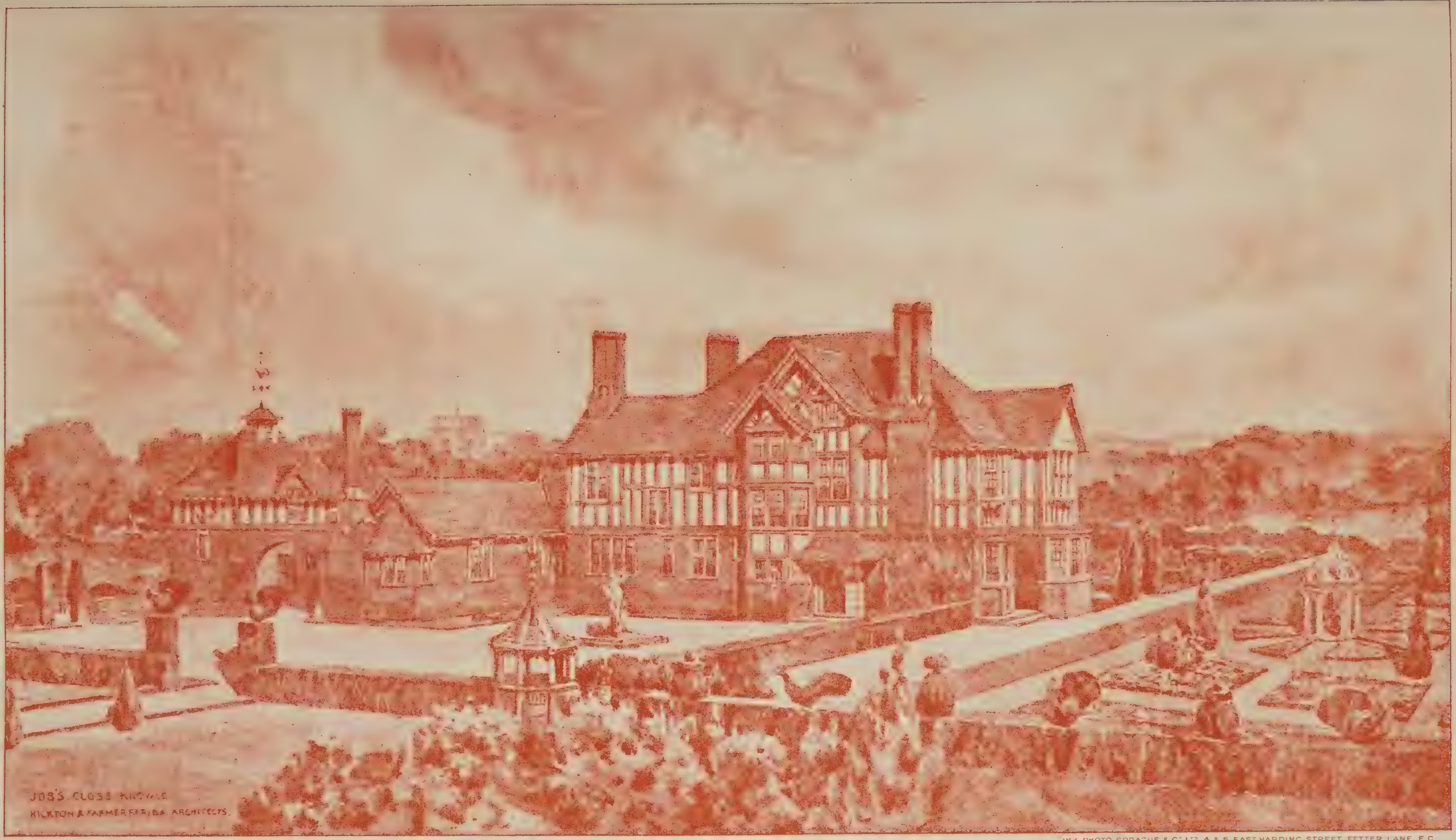

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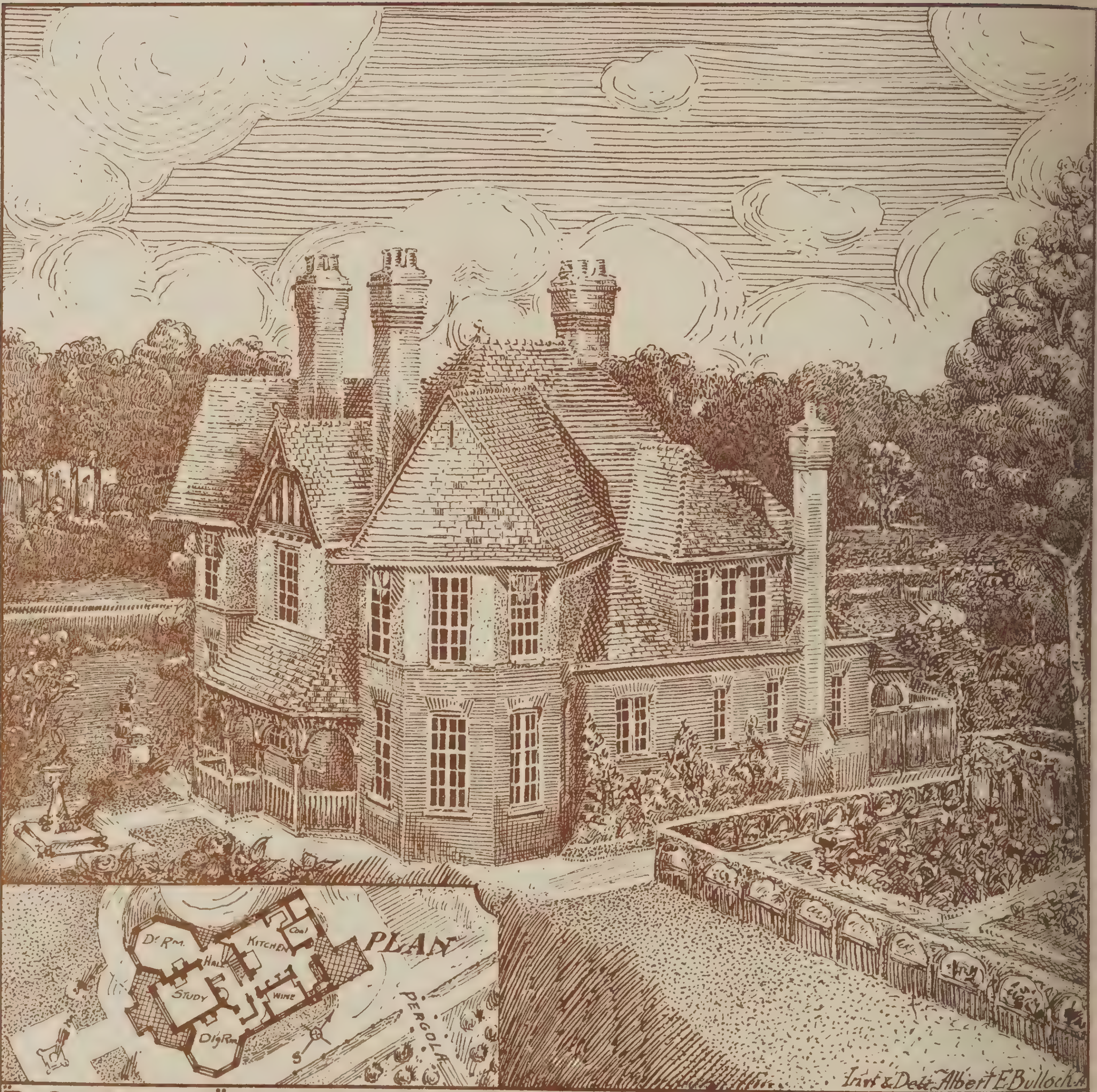

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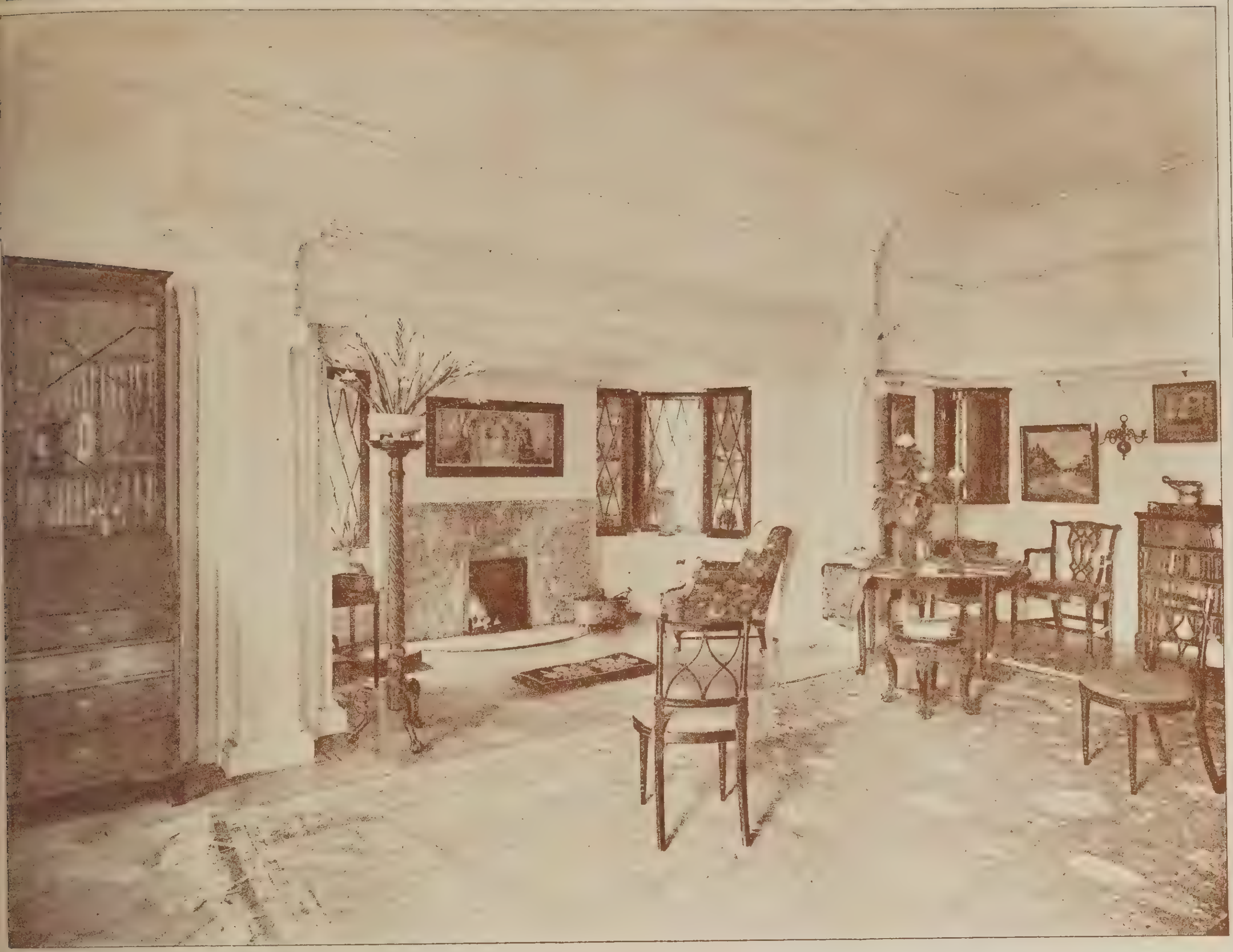
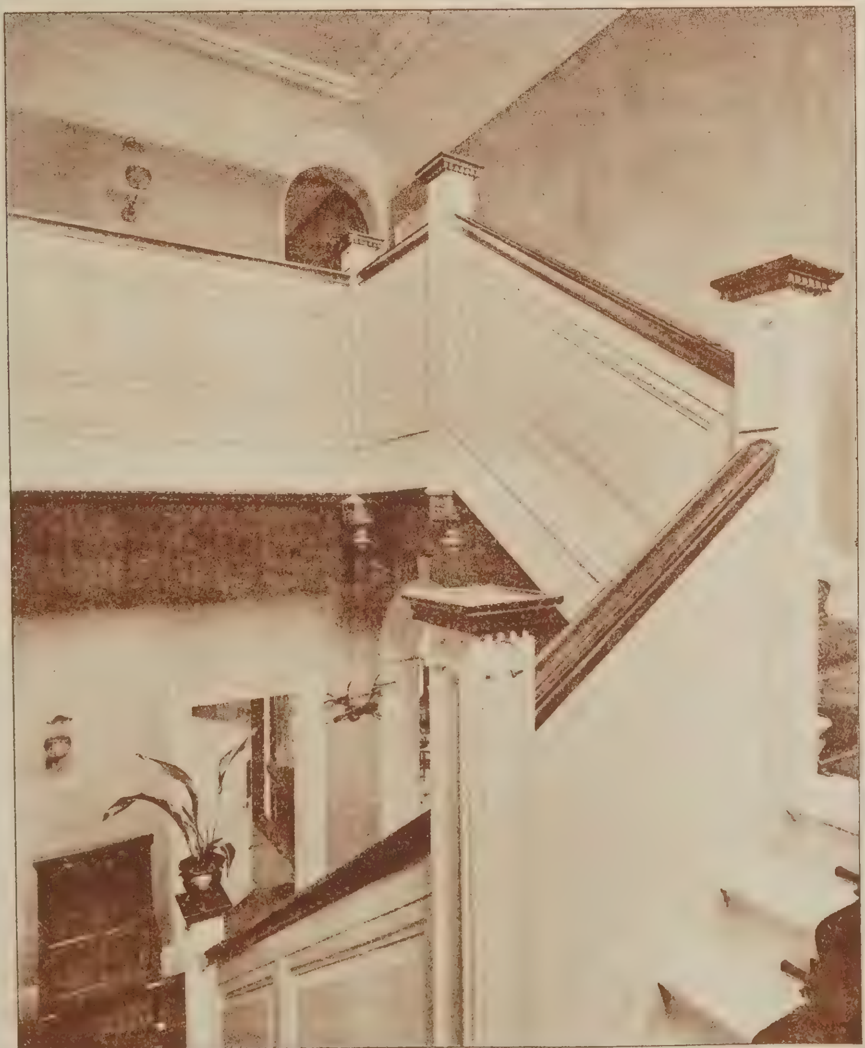


DRAWING-ROOM INGLE.



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HOUSE IN EDGBASTON: THE STAIRS, HALF-WAY UP.

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## FORTHCOMING EVENTS.

*Friday, June 3.*

Carpenters' Hall : Exhibition of Works in Wood and Wood Carving, opened on June 1, closes June 11.

*Saturday, June 4.*

Royal Institution : Paper on "Electric Heating and Pyrometry" (Lecture 1), by Professor J. A. Fleming, M.A., D.Sc., F.R.S.

*Monday, June 6.*

Royal Institute of British Architects : Business Meeting; Annual Elections.

Society of Engineers : Paper on "The Inspection and Testing of Engineering Materials and Machinery," by Mr. C. V. Biggs.

*Tuesday, June 7.*

Founders' Company : An exhibition of foundry work opened in Ironmongers' Hall, Fenchurch Street, E.C.

*Saturday, June 11.*

Royal Institution : Paper on "Electric Heating and Pyrometry" (Lecture 2), by Professor J. A. Fleming, M.A., D.Sc., F.R.S.

## ARCHITECTURE AT THE ROYAL ACADEMY.

### III.

THE display of church architecture in this year's Academy is not of a very remarkable character, and seems even more than other departments to have suffered from a desire on the part of the hangers to get in as many small frames as possible, so as to total up a good number in a restricted space.

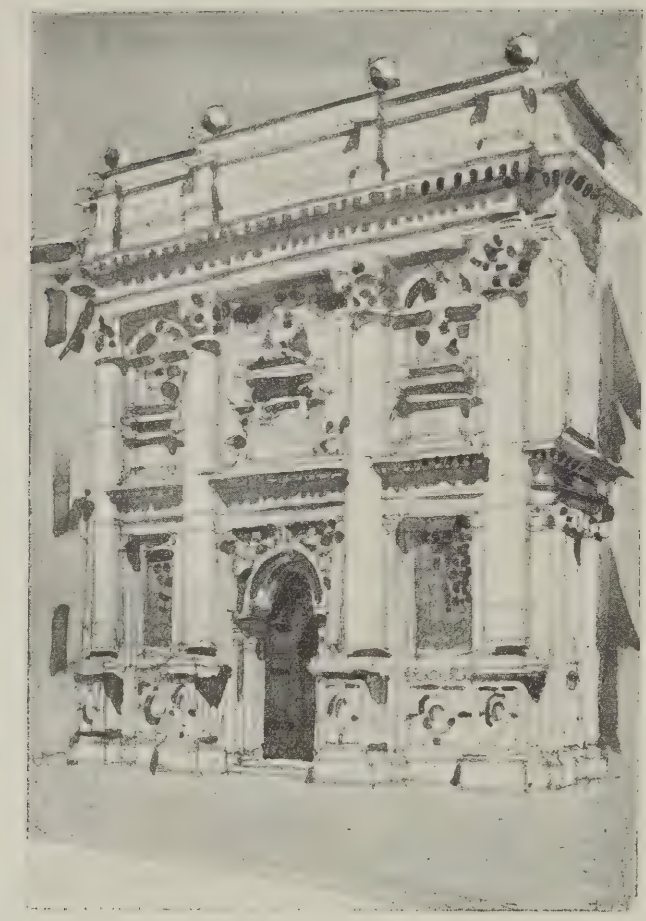
Mr. FRANK L. PEARSON'S "Brisbane Cathedral: Interior looking East," shows a design with Early English detail combined with German characteristics of massing. Apparently the cathedral is a "hall-church" with an apsidal east end, which, though, is closer to the French type than German. The nave arcade has a big triforium and no clerestory. The altar is surmounted by a curious baldachino or iconostasis. "St. Magnus Cathedral, Kirkwall: Restoration," by Mr. HIPPOLYTE J. BLANC, is a fine drawing of the interior showing Norman work in the chancel and Transitional in the crossing, with Jacobean screens. How much is original and how much "restoration" is not clear from the drawing. Another interesting drawing of similar character is "The Church of St. Helen, Ranworth, Norfolk: Proposed Restoration," by Messrs. W. DAVIDSON & E. J. MACRAE, in which the little church is made to look quite big. We hope the "restoration" does not include any re-painting of the famous screen, for the colour of the East Anglian screens to-day is very different to what it was at their first appearance, and any attempt at "restoration" must be shipwrecked on the Scylla or Charybdis of the original or the present. The church has needed repair for many a year, and the hammer-beam roof, of true Norfolk type, and the organ are quite enough of conjectural restoration, to say nothing of the rood-beam, which is scarcely even conjectural.

Mr. J. E. DIXON SPAIN'S "Swedenborgian Church, Willesden Green," is as peculiar in its design as the tenets of the sect for whom it is intended, being a study in red-brick herring-bone work with stone for the entrance. Suburban churches in which the designer has been limited for funds are quite a feature of the ecclesiastical architecture shown in the present Academy, and Mr. ARNOLD H. HOOLE'S "Church of St. Alban, Romford: Exterior," is apparently one of these, and shows how the most has been made of a limited opportunity. The "Church of St. John, Herne Hill," by Messrs. TREADWELL & MARTIN, is another example of a cheap suburban church in red brick with stone dressings, and here the architects seem to have been called upon to provide also Sunday-school or Mission-room accommodation on a lower floor for a sum barely sufficient to build an unpretentious church. "All Saints Church, Farnworth, near Bolton," by Mr. FRANK R. FREEMAN, is another cheap suburban church in which the designer has allowed himself the luxury of a good Perpendicular west window, but nothing else, as far as the drawing shows.

Mr. EDGAR WOOD'S "Design for Church," illustrated in *The Architect* of May 6, is another case in which the architect has been required to put his church proper over a Sunday school, and has solved the problem with characteristic originality and power. Messrs. HALL & DODS, in their design for "Proposed Anglican Country Church, Laidley, Queensland," have shown how a church for a tropical climate should be treated with windows reduced to a minimum, a verandah on the ground floor, and very widely-projecting eaves over a recessed clerestory, the whole an original and able design. Mr. GLENDINNING MOXHAM'S "Proposed Church, Gowerton, near Swansea," is a study in purple-grey walls with a few small windows and a tower. Mr. J. FRANCIS DOYLE in "The Harrison Memorial Church, Wallasey, and the Sir John Willox Memorial Church, Orrell," shown in one frame, maintains a fussy and restless feeling, too much approaching the type of chapel architecture in the eighties of the last century.

Mr. LOUIS AMBLER'S "Proposed Church at Holbeck Woodhouse, near Welbeck, Notts," though skied, looks a promising solution of an aisled church without clerestory in which the lighting is obtained from large east and west windows and the transepts. These, however, are carried up too close to the gable copings to be comfortable. A good square tower helps the composition. The "Church of St. Thomas, Charlton, Andover, Hants," by Mr. HUGH C. BENSON, is a small and cheap village church with a square shingled bell-turret to give character.

Mr. CHARLES J. BLOMFIELD'S design for "Proposed Rebuilding: St. Nicholas Church, Taplow," is one of the few that rise above starvation point, and is a good piece of Perpendicular work with a tower and spire, albeit the latter is somewhat, perhaps, Decorated in outline. "Church of St. Andrew, Coulsdon: Exterior," by Messrs. F. H. GREENAWAY & J. E. NEWBERRY, is another aisled church without clerestory, built of brown stone and red tile, in which the authors striving for the picturesque have evolved a new type of window, a traceried head with the sill at the springing, and even so with segmental-pointed arches. Mr. W. HENRY JEWITT'S "Reredos in Carved Oak: Painted Panels," is a very elaborate affair in late Gothic of Spanish type, with some Renaissance detail far too crowded and fussy, whilst the idea of a painted panel on high over others at



SAN GIUSTINA, VENICE.
Drawn by Leslie Wilkinson, A.R.I.B.A.

retable level furnishes quite a discordant clash. Mr. Roland W. Paul's "New Screens, &c., Weobley Church, Herefordshire," suffer from the affectation of cut-away mullions, which suggest that though the screen was not wanted as a screen, something must be put up if only the cornice and tracery heads.

In Mr. Temple Moore's "St. Wilfrid's Church, Harrogate," we have some refreshment after the wearisome monotony of unfortunate architects trying to design churches without money—a fine piece of composition, studiously irregular, suggestive of height, of triforium or galleries, with two obviously staircase towers at the west end. Messrs. J. Oldrid Scott & Son's "Proposed Design: All Saints Church, Pokesdown, Bournemouth," is clever, with a double south aisle at the west end of which is a small tower made to look big. There is a good Decorated window shown at the east end. Messrs. E. B. Hoare & M. Wheeler have produced a good effect in "St. Saviour's Church, Westcliff," with a wide nave and processional aisles, transepts, and morning chapel treated with Perpendicular detail. "All Saints Church, Porthcawl," by Mr. George E. Halliday, is another aisled church with no clerestory, but with a big square tower, which seems necessary in the design of this type of church to save it from insignificance, but which we fancy, in many instances, is a hope for the future.

Mr. Temple Moore's "St. Anne's Church, Royton, Oldham," has the big square tower to an aisled church with great roof and no clerestory. We do not understand the western projection; it seems to be large to be a narthex, and may be part of the church. A plan or section is wanted for explanation. Mr. C. E. Bateman shows the interior of "Hill Church, Sutton Coldfield," a barrel roof with ribs and apparently plaster decoration, and low squat arches to the nave arcade, with a modestly-treated chancel, the whole effective and unpretentious. "St. Gabriel's New Parish Church, Bishopwearmouth, Sunderland," by Mr. Clare A. C. Greene, is an example of modern treatment of Perpendicular with considerable originality, of which an octagonal lantern-tower over the crossing is one of the features and the oddity of marking in the parapet every buttress with a merlon is another. Spite of a tendency to eccentricity the design is an able one.

Mr. T. Rogers Kitsell proposes "Alterations to Chancel, St. James-the-Less Church, Plymouth," by substituting a barrel roof for open timber and elaborate Renaissance wood and metal work for poverty-stricken fittings of last century Gothic. But why is symmetry so essential as to demand two pulpits, and why are the sedilia on the north side, unless again to be symmetrical with those on the south which the view does not include? In the exterior of the east end of the "Church of St. Mary the Virgin, Laira, Plymouth," Mr. Kitsell has rather strained for richness in his Flamboyant Decorated window with angels on the mullions. Mr. R. Weir Schultz gives us this year "Khartoum Cathedral: West Front and Tower," of course maintaining the peculiar version of Romanesque that we saw last year from the east. The tower now appears complete at the west.

Mr. Charles J. Blomfield has a pleasant tower with stair turret of the type prevalent in Perpendicular times around London north of the Thames, in his "Proposed Additions: St. Mary's Church, Welwyn, Herts," which we presume includes also the west end shown in the drawing. A good design for "Lectern, Likoma Cathedral," is that by Messrs. Rogers, Bone & Coles, in which, in the drawing, an idea of great size is conveyed by the inclusion of small scale detail. A weird design is that for a "Baptist Church: St. John's Wood," by Mr. H. Rogers Houchin, who seems to have tried to outvie Peterborough Cathedral's west front. Mr. A. H. Ryan-Tenison shows the interior of his "Church of St. Michael, Beckton," the chief feature of which is a great hanging rood suspended from a barrel roof over a simple chancel screen. Mr. William A. Pite's sketch design for "Church of the Good Shepherd, Ealing," shown in small-scale elevations and plans, is a study of the style of church prevalent in the dead and lethargic times before Wesley, surely scarcely a good period to resuscitate. Of course a three-decker should be included, but Mr. Pite does not seem prepared to go quite so far as that. "St. David's Church, Bathgate," by Mr. J. Graham Fairley, is remarkable for the originality of design in the tower, but the author has scarcely escaped too close a resemblance to the town-hall type.

## NOTES AND COMMENTS.

Every architect and every other admirer of good craftsmanship should visit the exhibition of Works in Wood and Wood Carving which is now being held under the auspices of the Worshipful Company of Carpenters and the Worshipful Company of Joiners at Carpenters' Hall, and will remain open till the 11th instant. A very high level of excellence will be found to be maintained amongst present-day British craftsmen in wood and particularly in wood-carving.

The exhibition of drawings at the President's "At Home" on Monday last came as a surprise to many of the members of the Royal Institute of British Architects, who were unaware that the corporate body possesses so many remarkable and interesting examples of the work of famous men of the past. The late Mr. W. H. White, when secretary of the Institute, used to speak of these treasures, and lament that they should be hidden away and never properly appreciated, and since his time they have remained not only hidden, but practically forgotten, so that their exhibition on Monday came as a revelation. Having now been brought to light, we hope they may never again be relegated to the limbo of oblivion, but that means may be found when the Institute is in possession of its extended premises to maintain a permanent exhibition changed at regular intervals.

BY the will of the late Mr. HENRY JARVIS the Royal Institute of British Architects comes into a handsome windfall. The residue of Mr. JARVIS's estate is left in trust "For the Royal Institute of British Architects, the capital to be used either for the foundation of travelling studentships, to be known as the 'Jarvis' Travelling Studentships, or for the purchase and maintenance of a building to be used as the headquarters of the Royal Institute of British Architects." The trustees under the will are Mr. NICHOLAS SAVERY PASMORE, Mr. HERBERT DUNCAN SEARLES-WOOD, and Sir ASTON WEBB, R.A., who are to receive 20 guineas per annum each for administering the trust, which will probably amount to between 15,000*l*. and 20,000*l*.

SOME correspondence has taken place in the *Times* relative to the present condition of the wrought-iron screens made by JEAN TIJOU for WILLIAM and MARY and erected in the gardens of Hampton Court Palace. First there was the statement that after being moved to various parts of the grounds in order to preserve them from perishing by exposure to the weather, they were removed in 1865 inside the Palace and to various museums. In 1904 they were replaced on a curb of elegant ogee plan in the Privy Garden facing the river, where they form a palisade worthy of this Royal Palace. But it was felt at the time of their replacement that, in spite of very careful painting, the rich but thin ornament of acanthus leaves and eagles' heads with the festoons from their beaks would suffer injury from wet and wind. Unfortunately the destruction has been rapid, and the grilles are now in a far worse condition than was the case six years ago. Portions of the ironwork are red with rust, and should be painted without a day's delay. Worse than this, some of the eagles' heads are perforated by corrosion, the water does not drain off other parts, and the injury is going on. Indeed, nothing but immediate removal to a dry place can prevent the lighter parts of these screens from dropping to pieces with rust, and their becoming mere wrecks; whereas the gates of the east front of the Palace, made by the same smith, being protected by the overhanging cornice of the portico, are in as perfect condition as when erected more than 200 years ago.

THIS was followed next day by a letter from Mr. ERNEST LAW, who asserted that the injury received by the screens occurred during the 100 years that followed GEORGE III.'s accession and his abandonment of Hampton Court as a Royal residence. It was pointed out that TIJOU's two great gates, which have stood in the open for 218 years, are still practically unimpaired, and that the Office of Works is to be congratulated on the re-erection of the screens in the original position instead of being entombed in the Victoria and Albert Museum. The Office of Works has proved itself so excellent a custodian of all antiquities of historical and artistic interest that have been placed under its care that we feel confident that such valuable work as TIJOU's screens is being properly cared for, whilst there can be no question that with this proviso their retention in the position selected for them by WREN is æsthetically infinitely better than their seclusion in a museum.

PRURIENT curiosity could hardly go further than the suggestion that as the paving of Chelsea Old Church requires, in consequence of subsidence, to be taken up and relaid, the opportunity should be taken to test the truth of the tradition that the body of Sir THOMAS MORE is there buried. The evidence seems to be strongly in favour of the view that the body of Sir THOMAS MORE remains where it was originally buried, in the chapel of St. Peter ad Vincula in the Tower of London. It is true that MORE's monument stands in the south side of the chancel, but this was erected by MORE himself in 1532; and his son-in-law, WILLIAM ROPER, refers in his will to the vault at Chelsea "where my father-in-law, Sir THOMAS MORE, whose soul JESUS bless, did mind to be buried." CRESACRE MORE, the great-grandson of Sir THOMAS, states that "the body was buried in the chapel of St. Peter," but makes no mention of any subsequent transference.

THE law of ecclesiastical dilapidations is admittedly in an unsatisfactory condition, and entails undue hardship and even injustice in many cases, largely by the facility it gives for dilapidations to accumulate instead of requiring proper maintenance of the property of the Church by the incumbents for the time being. Hence we welcome the support given by the Upper House of Convocation of the Northern Province to the principles laid down by the Upper House of Canterbury:—(1) There must be periodical and compulsory inspection; (2) there must be annual payments by all incumbents—that is, a system of insurance; (3) surveyors should receive fixed salaries, and not be paid by fees.

AT the first annual meeting of the Edinburgh and East of Scotland Branch of the Garden Cities and Town Planning Association the future of the dockyard town of Rosyth came under consideration. Professor LODGE, in moving the adoption of the annual report of the Association, said that at Rosyth they had, on land owned, or largely owned, by the State, the prospect, he might say the certainty, of building up a very considerable town connected with the development of the Navy—a considerable dockyard town. They had all felt, he supposed, it would be a positive scandal if a town rising under these conditions were not built on model lines. Here was the growth of the town calculated, the ownership of the land favourable; here was this opportunity, and here was the Town Planning Act to give the necessary driving force. It all made one feel that unless the opportunity was taken, the garden city movement would be condemned, and the Act would prove itself rather a fiasco. There were with regard to this scheme certain proposals which had not yet taken shape, certain negotiations which could not be divulged, but he thought it was an open secret that the Admiralty was extremely well disposed to consider favourably any scheme for the proper and harmonious development of Rosyth on what might now be known as garden city lines. Secondly, it was no secret that the Scottish Local Government Board was eager and willing to use all the powers which the Town Planning Act gave it to encourage the development of Rosyth on such lines as he had mentioned. It was the duty of the Branch, if it could not take a share in the development of Rosyth, to watch over its development, and to keep public interest roused about it, and to render any service open to them.

MR. WILLIAM ROBERTSON, member of the Carnegie Trust, Dunfermline, pointed out the great practical difficulties that faced them in dealing even with such virgin soil as Rosyth. He said that he knew the owners of the ground, and their action was paralysed by the fact that the Government was prepared to feu 600 acres of land. The Government ground lay nearest to the busy part of the dockyard, and the adjoining proprietors' ground would come in after the Government ground had been dealt with. He thought the hopes of the Association must largely centre in what was done with this 600 acres of Government ground. If a beginning was made on that ground in the way of forming a garden city, that would probably give a lead to the character of future villages. But knowing the district as he knew it, he could not see how it was possible to be generous in the way of wide roads, open spaces, low houses, and low feus. The local authority, he took it, in this case must be the County Council. The local authority had laid a water supply. It was estimated to cost 100,000*l*. It had actually cost 200,000*l*. It was undertaken with a view to meeting the needs of a probably large population, and it would be some years before they could have anything of an income from rateable subjects on that land. A drainage scheme was estimated to cost over 100,000*l.* The County Council naturally hesitated to adopt a scheme of that extent, because who meantime was to bear the assessments? They could not expect the income from land as it was to-day to meet the cost of a huge drainage scheme intended to meet the needs of a large and closely concentrated population. As this 600 acres of land were a sort of by-product of the Naval Base, the chances were that the Government would be willing to feu that land at a very low price. If there was any fear of their doing that, they could quite well see the local authorities would hesitate as to committing themselves to a drainage scheme until they knew where they were. He thought that the best solution would be if the Government handed over the acres to the Garden City Association to develop.

We regret to note that the Manchester City Council has refused to make to the Art Gallery Committee the usual provision of the sum of 2,000*l.* for the purchase of works of art, and also to further reduce the grant to the committee by 400*l.* This, although the estimates for the year, without this crippling of the Art Gallery, showed a decrease in the city rate of 0.63*d.*

The decision of the Divisional Court of the King's Bench in the case of Collins *v.* Greenwood is of interest and importance. The case was an appeal from a decision by the justices of Durham that a stable erected by the respondent was not a "domestic building" within the meaning of the by-laws. The justices found as a fact that the respondent had built the stable without having a plan approved by the District Council, but, being of opinion that it was not a domestic building within the meaning of By-law 1, and that there was no contravention of the by-laws, dismissed the information, but agreed to state a case for the opinion of the High Court. Their Lordships were divided in opinion, Mr. Justice Coleridge, who dissented from the conclusion of the other judges, holding that the justices were wrong, and that there ought to be a conviction. The Lord Chief Justice and Mr. Justice Channell were of opinion that it was not a reasonable interpretation of the by-law to hold that a stable was a domestic building requiring windows and an extended air space for ventilation. They therefore agreed that the justices were right in dismissing the information. The appeal was therefore dismissed, with costs.

The absurdity of the conditions under which local authorities too often expect responsible positions to be accepted has been well satirised by an applicant to the Ruthin Rural District Council for the post of surveyor and sanitary inspector, which had been advertised at a salary of 80*l.* a year, including expenses, the successful candidate to devote the whole of his time to the duties of the office. The applicant said he was tall and good-looking, able to speak eight languages, and was at present learning others. In addition to carrying out the ordinary duties mentioned in the advertisement, he was willing without extra remuneration to act as police constable, as caretaker of the municipal buildings, as fireman, assist at the cleaning of streets and the collection of house refuse. The writer said it appeared that there was need to provide a future home for the beneficial treatment of maniacs in the district, and should the soil be clayey he would make bricks in his spare time for the building of the "home," and he would even clean the councillors' boots with "Nugget" bought with a portion of the lavish salary offered. He had spent 600*l.* to qualify as a sanitary engineer, but he thought the post such a unique one that it would give him ample scope to complete his education in municipal work. The applicant concluded by asking permission to keep fowls and a cow, in order to provide the poor of the district with eggs and milk free.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### X.—METHODS OF COOLING.

So far we have dealt in a general way with the construction of cold stores and with refrigerating machines. These form the component parts of a cold storage installation, but unless the proper connection is made between the two a self-contained whole cannot be produced. To explain how such unity can be established is the object of the present article.

We have spoken very freely of the refrigerating "machine." It should be explained, before going further, that this is a term in the interpretation of which much undue latitude has been allowed and taken. A refrigerating plant, as we know, consists of three essential units: the compressor, the condenser, and the evaporator. Of these three the compressor is actually a "machine," but the others are merely accessories. Hence the undesirably loose practice has grown up of applying the expression with indifference either to the compressor only or to the complete plant, according as the purpose of the speaker or writer might best be served. In these articles let it be stated, to avoid any misunderstanding, that the latter is the sense in which the term will invariably be employed, and that each of the separate units will be referred to by name.

The unit which we have to do with now is the evaporator. The compressor and the condenser, with which we are acquainted, are quite separate from the cold rooms, but the evaporator is intimately connected with them. It consists (to recapitulate) of the coils of piping, in which the suction of the compressor causes the refrigerant to vaporise, and consequently to draw its latent heat from its surroundings, rendering these intensely cold.

In the ordinary evaporator, as already explained, the coils are immersed in a tank, filled with unfreezable brine, and the chilled brine is circulated by a pump to and from the spot where the actual cooling is required. The brine acts, in fact, as a carrier. This apparatus is the evaporator proper, but we may also place the evaporating coils inside the cold rooms themselves. We have then what is known as direct expansion. A further modification is to place the pipes in the cold room, but at the same time to surround them with brine either in tanks or drums. In this way the two first arrangements are combined and the advantages of each obtained. Yet another system, introduced originally by St. Clair, is to build the pipes into stacks in a separate chamber and to circulate the air from the cold room over them by a fan. This is known as the cold air blast method.

There are, therefore, four principal methods of cooling cold stores:—

1. Brine circulation.
2. Direct expansion.
3. Direct expansion and still brine.
4. Cold air blast.

*Brine Circulation.*

For the sake of simplicity in explaining this method of cooling, we take as example a small cold room, 360 cubic feet inside capacity, connected to a small vertical compressor, with its attendant condenser and evaporator. These are shown both in plan and elevation in fig. 31. The compressor, marked "A," is bolted to the side of a strong cast-iron tank "B," which contains the condensing coils. It is arranged for belt drive, and the pulleys are seen on the opposite side of the condenser tank, through which the driving shaft is carried. The refrigerant used is sulphur dioxide, and the machine is therefore enabled to operate at the low condensing pressure of 45 lbs. per square inch (with cooling water at 70° Fahr.). At this pressure, by means of the delivery pipe "C," the compressor discharges the gas into the condensing coils. There it is liquefied, and spurts through the expansion valve "D" into the pipe "E," which leads it to the coils of the evaporator. These are immersed in calcium chloride brine, contained in the well insulated tank "F," and are connected once more to the compressor by the suction pipe "G." Through this pipe the vaporised gas is drawn back to be recompressed after having absorbed its latent heat from the unfreezable brine.

This is the first circuit, which is followed by the gas. The second, interlinked with the first, but quite separate from it, is that followed by the brine, and the agitating force in this case is, instead of a compressor, a small rotary circulating pump "H," which is driven off the driving shaft near the pulleys. It is connected to the bottom of the evaporator tank, and sucks therefrom the coldest brine, which it discharges by pipe "J" to the drums in the cold room. These consist of 7-inch or 8-inch galvanised cylinders, having end plates arranged to take the necessary connections. They are supported on bars, which are carried from the ceiling by forged hangers, and are kept equidistant by the stiffness of their end connections. The arrangement of the latter will be seen by inspection. Delivery of the cold brine to the first drum must take place at the bottom, and its exit is arranged at the top. It then flows to the bottom of the second drum, leaves at the top for the bottom of the third, and so on, finally quitting the system at the top of the last drum, whence it returns through the return pipe "K" to the evaporator. In this way the circulation is greatly aided by convection currents within the drums. The pipe "K" should be stopped some distance above the tank in order that the return flow of the brine may be visible, and any checking of same at once made obvious. A probable cause of such a checking would be the locking of air in the higher points of the circuit, and, to avoid this, petcocks should be placed at all points where the said locking might occur.

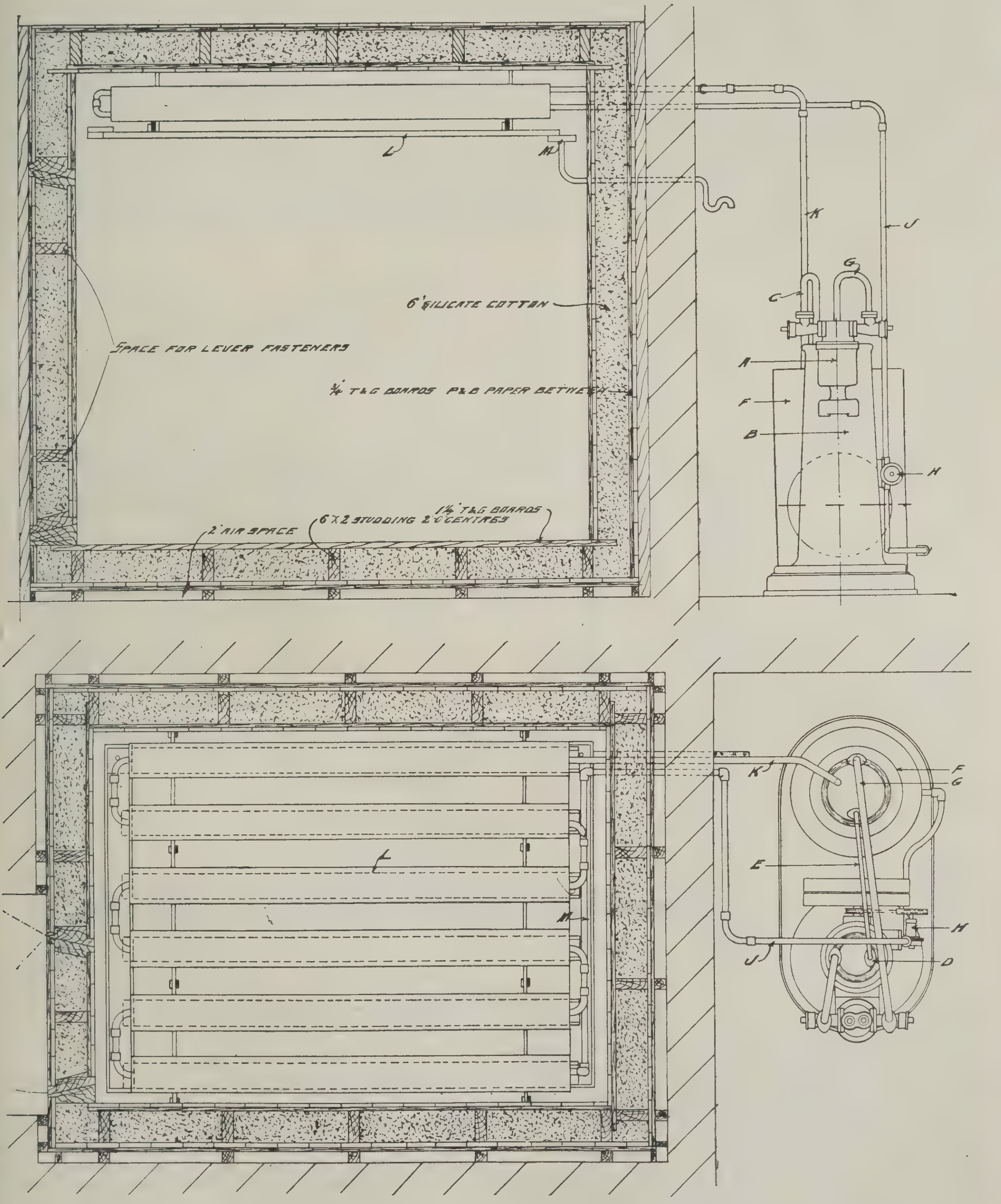

L
M
K
J
G
C
6" SILICATE COTTON
SPACE FOR LEVER FASTENERS
A
F
3/4" T&G BOARDS P&B PAPER BETWEEN
B
H
1 1/4" T&G BOARDS
6 X 2 STUDDING 2'-0" CENTRES
2" AIR SPACE
K
F
G
L
E
M
H
J
D

FIG. 31.—SMALL COLD ROOM COOLED BY BRINE CIRCULATION.

When the brine returns to the evaporator its temperature under ordinary working conditions will have risen by some 6—8° Fahr. It is then gradually cooled by the vaporisation of the sulphur dioxide inside the coils, and finds its way to the bottom of the tank, whence it is sucked once more to the circulating pump and discharged to the drums. All pipes in the circuit which are exposed to the air, as well as the brine tank itself, should be well protected by suitable lagging.

The circulation of air in the cold chamber under this system is effected simply by convection currents, and is in consequence rather more sluggish than it ought to be. As the heated air from the goods in storage during its upward progress reaches the brine drums, it is suddenly chilled, and at once deposits its moisture in the form of snow on the cold metallic surface offered to it. At intervals this snow should be allowed to melt off, dropping, as it does so, in the form of water on to the drip shutes "L" provided. From these it runs to the collecting shute "M" at the lower end of the other shutes, and thence by a trapped pipe to the nearest drain.

Instead of placing the drums on the roof, they might be built into a stack at one end of the room and separated from the rest of the chamber by a thin partition. Hot air could then be sucked in from the top of the apartment by a fan, cooled by contact with the drums and discharged into the room again through holes in the bottom of the partition. Great dryness of the air is obtained in this way, and also a continuous circulation, which is found with some classes of goods to be most essential. The snow water is with this arrangement collected in a lead tray, which is connected by a trapped pipe to the drain in the usual way.

Yet another method frequently adopted is to circulate brine in 2-inch galvanised pipes. These are arranged in grids round the walls and on the ceilings of the rooms, being subdivided into sections for the purpose of easy regulation and for thawing off the frost from each in turn. No partition is erected between the pipes and the cold store, and circulation is entirely by convection. This system is greatly favoured for large stores in America, and for certain classes of goods has its advantages. Where there are many rooms and several floors, as in public stores, it is as well when brine pipes are used to have separate delivery and return pipes for each floor, these being connected to distributing mains, from which branches are led to the various rooms. The usual precautions should be taken to prevent locking of air.

Brine circulation, as a method of cooling, has the great advantage that it permits of easy regulation of the temperatures, and tends to eliminate small variations. In this respect it might be likened to the flywheel of a gas engine, which converts the irregular bursts of the explosions into a uniform and even turning movement. It possesses in fact, that useful quality "inertia" whereby all the irregularities which are always present in direct expansion are toned down to a mean value. This, in certain cases, as will presently be seen, is of the highest importance.

Another advantage of brine pipes in the chambers, which is more telling in America than in England, is that, in the event of a breakdown of the refrigerating machinery, it is possible still to refrigerate the rooms on the system introduced by Mr. Madison Cooper. This is exactly analogous to the hot water arrangements in an ordinary house. At a higher level than the pipes on the cold chambers a set of coils is placed, immersed in a freezing mixture of ice and salt, contained in a large tank. The pipes in the chamber are then connected to the coils in the tank, and the whole system of tubes is filled as usual with brine. The effect is that the brine, while doing its cooling work in the stores becomes heated, and rises by displacement to the coils in the ice and salt above. There it becomes cooled and finds its way by the return pipe back to the cold rooms, and the circulation is thus kept up continuously. In installations where uninterrupted running is essential and where there is no stand-by compressor, this adaptability is a great point in the favour of brine piping.

With brine it is also possible to lay up a store of "cold" (to use once more a most convenient inaccuracy) for use when the machinery is stopped. To effect this the plant is run for some hours on the brine tank until a very low temperature is obtained. The brine can then, if the pump is kept going, be circulated through the rooms and the cooling carried on as usual, after the main plant has been shut down. In many cases this is extremely convenient.

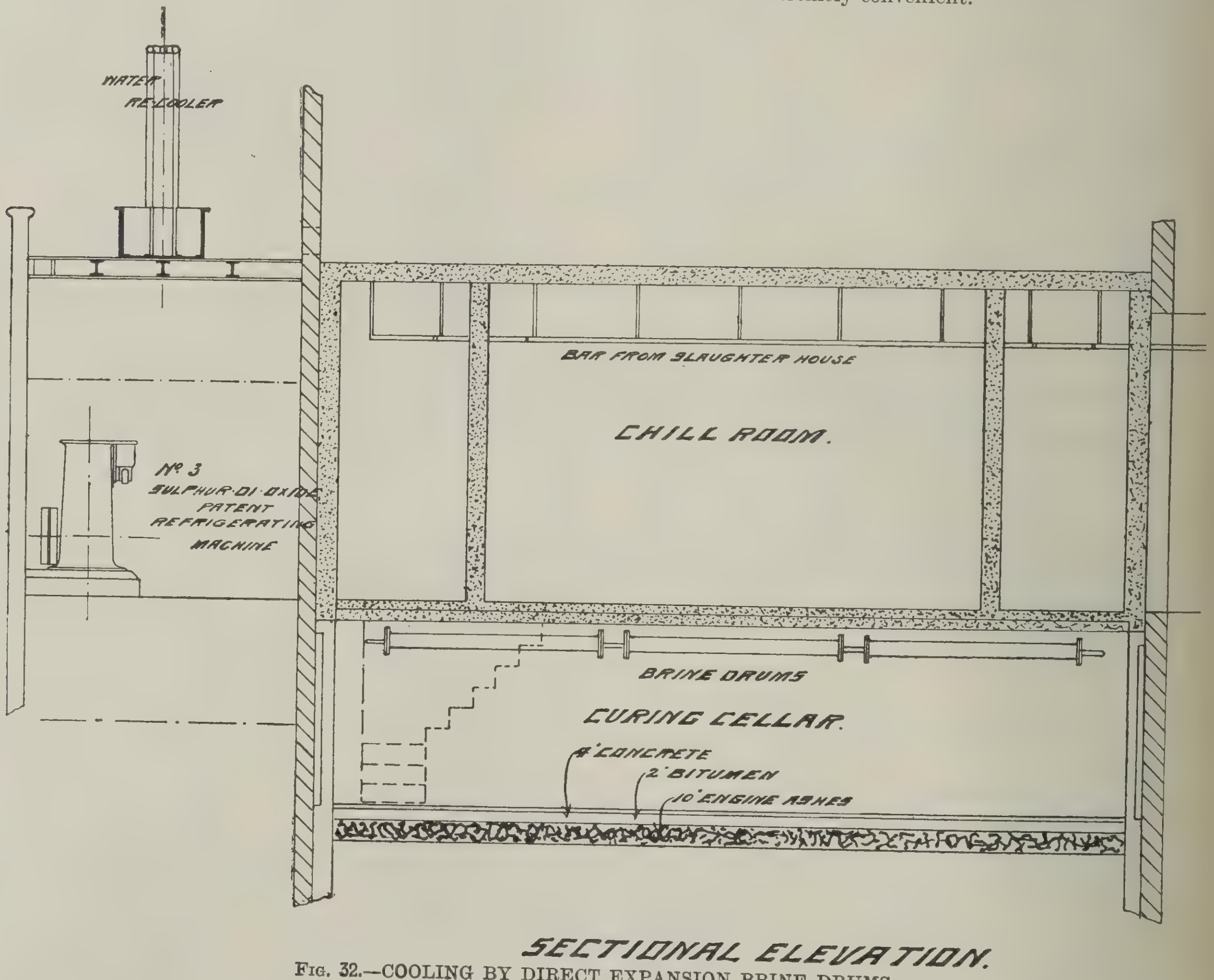


FIG. 32.—COOLING BY DIRECT EXPANSION BRINE DRUMS.

### *Direct Expansion.*

As far as construction goes this is the simplest system of any. No brine tank is needed and no fan or separate air-cooling chamber. The evaporating coils, which are connected direct to the compressor and condenser, are fixed to the sides and ceiling of the cold rooms, and the hot air rising through the goods in storage comes into contact with these by flowing in convection currents. When it is cooled it descends again by gravitation to the bottom of the room, and is able to restart its upward path. Its moisture is to a large extent condensed on the piping owing to the sudden chill, and forms snow, which must be scraped off, if the plant is running continuously, or which falls as snow water if there are intervals. A very good plan, if the piping is arranged, as it should be, in several sections, is to shut down each section in rotation as the snow accumulates. That particular section is then thawed out or defrosted, and when all the snow on it is melted, can once more be switched into circuit. In the meantime since only a small portion of the total range of pipes has been interfered with he cooling effect is not materially lessened. In any case drip hutes, arranged to fall towards a suitable outlet, must be ixed underneath each range of pipes.

Direct expansion for quite a long time in the early history f refrigeration was regarded with great disfavour. There vas a strong prejudice existing against it, which was probably due to the innate conservatism in man, but was ostenibly put down to the fear of leakages. Long trial and experince have proved however that no such danger really exists, nd the system is now, on this side of the Atlantic, and for emperatures below freezing point, more widely in use than ny other.

Its first chief advantage is great simplicity of construction, ombined with low first cost. To begin with, the gas inside he pipes is at a lower temperature than the corresponding rine would be, and more heat is therefore abstracted per quare foot of pipe surface. This means that the length of ipe necessary to cool a given space to a given temperature is ess, and that, for this reason alone, quite a large economy nust be effected. As a matter of fact, the length of pipe of he same diameter required with direct expansion would be nly two-thirds, or even one-half, of what must be put in with rine. A simple calculation will show what a saving this neans, when it is a question not of feet, but of many miles of ubing.

More important even than this reduction is the total limination of the evaporator (in its brine tank form). In the rine system it is obvious that at least the same amount of ieat must pass from the brine through the evaporator coils to he refrigerating gas as is taken by the brine tubing from he cold rooms. That is to say, as the temperature difference is bout the same in each case an amount of pipe surface must e provided in the evaporator coils at least equal to that xposed by the brine tubing to the cold rooms. Hence with rine not only is the amount of tubing in the room itself inreased, but the new total, including the increase, is doubled n the evaporator. If we also add to this the cost of the nsulated brine tank, which forms an integral part of the vaporator, and that of a brine circulating pump with belt nd pulleys, it is obvious that quite a formidable total is btained. No difference is made in the method of fixing the ipe to the walls as that is the same in both cases.

The second important point in favour of expanding lirectly in the cold rooms is that the temperature of the gas, lthough lower than that of the brine would be, is not so low s the temperature of the gas in a brine tank evaporator. Hence the compressor can work with a higher suction or 'back'' pressure (since this depends on the evaporating emperature) and consequently absorbs less horse power. It ollows that the running costs, as far as the coal or electricity ill is concerned, are considerably reduced.

It has been urged by its detractors that, where there are several rooms to be maintained at different temperatures, involving of course different back pressures, direct expansion fails. There is a certain amount of truth in this, as the varying pressures in each of the parallel circuits formed by the different rooms are bound to produce a slight unevenness of working. In the writer's experience, however, the difficulty is slight, and by paying proper attention to the different expansion valves can be quite easily overcome. In extreme cases it can be practically eliminated by subdividing the coils in each room into sections, and regulating the temperature by shutting off one or more sections in a given room as required, making the finer adjustment by means of the remainder. The back pressures would then all be approximately the same, but the system, except in rare cases, is not a good one, and is rendered exceedingly complex by the multiplication of valves. In fact, where the difficulty of widely varying back pressures arises (which will be only seldom) it will be found much simpler and quite as efficient to adhere to the ordinary arrangement. The only real trouble with direct expansion is that the cooling effect comes sometimes in gusts, as it were. To overcome this, where it is absolutely essential, the brine "flywheel" must be brought into being.

### *Direct Expansion and Still Brine.*

This system is used in installations of moderate size, when the circuits are on the direct expansion principle, and it is essential that one should be steadied by the action of brine. In such a case it would not be economical to instal a special evaporator for the benefit of that one circuit, and the compromise known as direct expansion and still brine is therefore adopted. The arrangement is illustrated in fig. 32, which shows a vertical section of a small refrigerating installation, consisting of a chill room for beef and mutton, with an air lock at either end, and a bacon-curing cellar underneath. Meat is brought into the chill room at one end when it has hung for some hours after slaughtering, and, when required for use, is taken out at the other end for distribution. For this purpose air circulation is necessary, and the chill room is cooled on our fourth system—the cold air blast. In the curing cellar below, however, an even, never varying temperature had to be maintained, and to avoid installing a special evaporator, direct expansion brine drums were put in to give the necessary steadiness. These consist of 8-inch galvanised drums filled with still brine. Through them, by stuffing boxes in the end plates, pass 1¼-inch pipes, which communicate their cooling effect to the brine, and are connected direct to the refrigerating compressor and condenser, seen in the engine room to the left hand, where the gas engine driving the compressor and dynamo is also located. It should be noted that, owing to the scarcity of water, a recooling apparatus for the condenser water was installed on the roof.

The action of the direct expansion brine was also assisted by blasts of fresh air from the chill room cooler.

## ALL SOULS COLLEGE, OXFORD.

By C. GRANT ROBERTSON, M.A.

THE buildings of All Souls College offer a triple interest to the student and sightseer—the interest of the historical evolution of the College from its foundation in the year 1438 to its present form, the interest of architecture æsthetically considered, and the interest of the builder's technique, which appeals especially to the professional expert. In the following brief paper the first two elements alone are considered, since the writer is not properly qualified to discuss problems with which no one but a trained architect could satisfactorily deal. Broadly speaking the buildings of the College as a whole fall into three well-marked groups, corresponding respectively to three historic periods of expansion. To the first—the epoch of foundation—belongs the present front quadrangle, which contains the original chapel, the old library and the site, though not the construction, of the modern hall. To the second in the sixteenth century we owe what is now called the warden's quadrangle, bounded on the east by the warden's garden and on the south the extension of the face of the front quadrangle along the High Street. From the third in the eighteenth century comes the new hall, the great quadrangle lying to the north with its piazza cloister, the Codrington Library, and the block of buildings which links the library with the hall. Since the middle of the eighteenth century there has been very little additional building, and the boundaries of the College to-day remain practically as they were demarcated about 1750.

The buildings therefore contain in epitome the history of the College in its successive expansions, and present to the historical student of domestic and public architecture interesting examples of various clearly defined styles. It is worth noting that in comparison with several of the other Oxford colleges All Souls has been less tampered with by the restorer of previous generations, while the College archives contain material which enables the student to examine several of the stages in full detail. In particular, a drawing of the College as it existed in 1598 (reproduced in a reduced form as frontispiece to the present writer's "History of All Souls") is exceedingly valuable, as it is obviously a work of care and accuracy, and provides an instructive comparison with the freely drawn and somewhat imaginative crude cuts to AGAS's well-known map of some thirty years earlier, and to LOGGAN's print of some eighty years later. Not, of course, that the restorer has not in All Souls at various epochs been as anxious to "improve" as elsewhere in Oxford, but fortunately the most elaborate efforts of the middle eighteenth century in this direction were frustrated. Conversely, the "restorative" work of the last quarter of the nineteenth century has been devoted mainly to removing the results of previous partial restorations, with the object, where it has proved possible, of bringing back the buildings to their original form. This has been, as will be seen further on, especially the case with the chapel.

The front quadrangle, begun in 1438, remains virtually the same as originally planned. It is perhaps the best example of unrestored fifteenth-century work in Oxford. The cusps of the windows have been apparently cut square (probably in the seventeenth century), grass has been laid down in the centre, and much of the stonework has of necessity been refaced. But the original lines remain intact. The original carving on the main gateway —the souls rising from Purgatory, thanks to the prayers of the faithful—still remains, and though the internal division of rooms has been in places reconstructed, doorways and archways have been untouched. The tower is a genuine fifteenth-century tower, and the whole presents an instructive plan of the collegiate economy of the late Middle Ages. Into this quadrangle were packed on the founder's scheme the warden and forty Fellows; the warden alone had two rooms (on the right-hand side, first floor, as you enter), partly forming the arch above which the tower rises. Here lived the warden, thus able to see all that went in or out of the College. The chapel forms the north wall, and is large in proportion to the rest of the then existing College. But, seeing that All Souls was founded by HENRY CHICHELE, sometime Archbishop of Canterbury, to be both a religious and a studious foundation, the chapel naturally was the centre of the Society. The plan seems to be based on that of New College, of which CHICHELE was both a scholar and Fellow, and both on Magdalen and All Souls the genius of WILLIAM OF WYKEHAM, the most original and munificent of the founders of Oxford colleges, has left its stamp. The first hall ran at right angles to the chapel (not as at present a continuation of its lines), and the drawing of 1598 shows that it was surmounted by a large lantern. As at New College and Magdalen, so at All Souls, the fact that the hall was built on to the east wall of the chapel prevented an east window from forming a feature of the building. Hence above the main altar in all three colleges comes the stone reredos, which is so memorable for all who have compared the architecture of these three chapels. The chapel at All Souls has a unique and dramatic history. You enter through a stone-vaulted passage with fan-tracery on the ceiling into the antechapel, separated from the chapel proper by a screen. At All Souls the antechapel does not form a strictly rectangular oblong, for it is narrower at the north than at the south end. This is apparently due to two causes: the west and outer wall follows the slanting line of the mediæval street ("Cat Street," not "St. Catherine Street," as a modern municipality in defiance of well-attested historical facts has chosen to name it), but in order to make the orientation of the high altar correct and keep the form of the chapel rectangular the inner line of the antechapel marked by the screen has been taken out of the true parallel. The difference is scarcely perceptible to most sightseers, but when once it has been pointed out it is strikingly apparent. The present screen of painted wood and Classical design dates from the seventeenth century. The first screen was probably Gothic in form (though no drawing of it exists) and disappeared in the sixteenth century. Though its style is wholly different from that of the rest of the architecture, the contrast is really not so jarring as description on paper might suggest. The oak stalls with their beautifully carved miserere seats (no two alike in the whole chapel) date from the foundation, and the woodwork, though not the carving, has only been slightly restored. The original reredos, "the things they call organs" (the position of which is uncertain), and the six altars were all either mutilated or destroyed by the Protestant reformers in 1549. The organ has never been replaced, and to-day All Souls alone of all the Oxford colleges has no music at its services. For a century the reredos remained a defaced ruin. In the seventeenth century the wall was plastered up and covered first with one fresco (of which EVELYN said that "it had too many nakeds for a chapel"), and then with another, representing the Apotheosis of CHICHELE. The windows were altered, the oak stalls painted over, and the superb hammer-beam ceiling filled in and transformed out of existence. An altar with an entablature was then placed against the east wall, and so the chapel remained until 1870, when some necessary repairs to the fresco revealed to a college and a world that had forgotten that All Souls once had a reredos the remains of the beautiful fifteenth-century stonework beneath. Thanks to the munificent benefactions of past and present members of the foundation, notably Earl BATHURST, who alone gave 4,000*l.*, a thorough restoration of the chapel was undertaken, and under the guidance of Sir GILBERT SCOTT the reredos was reconstructed, the hammer-beam ceiling once more brought to light and renovated, the paint taken off the stalls and desks, and the windows recut to their original form. So far as the historic data could provide, the chapel to-day represents the chapel that CHICHELE and his immediate successors planned. Its chief glory is the reredos, which both in form and workmanship is superior to that both at New College and Magdalen. One feature the modern restorers shrank from attempting to replace. A careful inspection of the reredos shows that in its fifteenth-century form the stonework, both of niches and the canopies over the statues, was completely coloured in red, blue and gold. The problem of restoring this colour without adequate authority as to its scheme, nature and extent, was regarded, and probably wisely, as too difficult to be satisfactorily solved. But it is interesting to note that quite recently, under the expert advice of the late Mr. KEMP, the College, when restoring the tomb of Archbishop CHICHELE in the chancel of Canterbury Cathedral, decided not merely to remove the baroque and grotesque additions made in the seventeenth century, but to replace the original colouring on the stonework. Those who know the cathedral will probably agree that the restoration has been eminently successful, and the tomb of the founder of All Souls is now one of the finest of fifteenth-century memorials existing in this country.

*(To be concluded.)*

## COMPETITION FOR ENLARGEMENT OF QUEEN'S UNIVERSITY, BELFAST.

IN the particulars of this competition Sir ASTON WEBB, C.B., R.A., has found it possible to follow the suggestion made in the professional Press as to the reduction of the labours of competitors. The only drawings required are plans, two elevations, and two sections to a scale of 20 feet to an inch, and a small bird's-eye view is optional. Nobody, we think, can object that in this case too much is asked of competitors.

## ILLUSTRATIONS.

### OXFORD COLLEGE SERIES, ALL SOULS.—QUAD—FRONT QUAD.

WE commence this week the illustrations of All Souls College, of which an historical and descriptive account appears on p. 351.

### COMPETITION DESIGN FOR NATIONAL MUSEUM OF WALES

MR. A. GILBERT SCOTT, the author of the competition design we illustrate this week, says:—

In this design my object has been to produce a building with some of that elusive "abstract" quality peculiar to great buildings, and which seems so lacking in most of our modern buildings.

I have endeavoured to design it "as a whole," the internal halls rising above the rest of the building helping the exterior to express the interior.

I have made no attempt to reproduce the design of the adjacent buildings, the purposes of the buildings being so very different that I felt this would be an architectural mistake. The lower cornice of the design carries through the level of the City Hall and Law Courts, which is all that is artistically necessary.

As regards the planning, all the public exhibition galleries are on the ground floor, a great convenience both for the public and for supervision purposes.

The reserve was specially arranged to be "well away from the noise and traffic of visitors to the galleries," as requested; and none of the public galleries are dependent upon side lighting.

## ZINC OXIDE.*

*(Continued from last week.)*

THE chemical equations showing the reaction are as follows. Combustion of the anthracite with production of $CO_2$ and $CO$:—

$$C+O_2=CO_2$$
$$CO_2+C={}_2CO$$

Reduction of the ore: $-ZnO$ (of the ore) $+ Co = Zn$ (in vapours) $+ CO_2$ $ZnO$ (of the ore) $+ C=Zn$ (in vapours) $CO$ (in the presence of coal).

The re-oxidation of the metal in vapours:—

$$Zn+O=ZnO \text{ (white zinc).}$$
$$Zn+CO_2=ZnO+CO \text{ (white zinc).}$$

This second reaction takes place because it is not in the presence of coal, the reagents Zn and $CO_2$, being in a gaseous state, are in the upper part of the chamber (K), and even in the tubes (M), plan 3 and 4. Of course, in the presence of coal the inverse reaction takes place, as we have seen in the reduction of the ore. It will, no doubt, be interesting to give some information concerning the ores usually treated by this method.

In the United States, most of the ores consist of a mixture of franklinite—chemical formula, $3\ FeO + 3\ ZnO + (Fe\ Mn_2)O_3$. Willemite, chemical formula: $2\ ZnO.SiO_2$ and a little zincite, $ZnO$. Here is the approximate composition of such ore:—

| | | |
|---|---|---|
| $SiO_2$ ... ... ... ... | 9 to 12 | per cent. |
| $Fe\ 2.0_3$ ... ... ... ... | 28 to 33 | ,, |
| $MnO$ ... ... ... ... | 15 to 12 | ,, |
| $ZnO$ ... ... ... ... | 35 to 30 | ,, |
| $CaCO_3$ ... ... ... ... | 9 to 4 | ,, |
| $MgO+Al_2O_3$ ... ... ... | 3 | ,, |

Thanks to the magnetic separation which is now in practice, it is possible to separate almost completely the willemite used for the manufacture of the metallic zinc from the franklinite and zincite employed more especially for the manufacture of white zinc. With such ores the residues obtained from the zinc oxide furnaces come in the form of clinkers, which are smelted in blast furnaces for spiegeleisen. These residues are composed approximately of the following:—

| | |
|---|---|
| $SiO_2$ ... ... ... ... ... ... | 16.00 |
| Fe ... ... ... ... ... ... | 37.00 |
| Mn ... ... ... ... ... ... | 16.00 |
| Zn ... ... ... ... ... ... | 6.00 |

As it will be seen from the following composition, these residues are in reality iron manganese ore with a fair percentage of zinc. The blast furnaces employed for their treatment are of special construction, being approximately 36 feet high and 6 feet in diameter. The gases are not in this case taken off by tubes of large calibre, as is customary, but by bunches of small sheet iron tubes forming an extensive wall space, thus facilitating the precipitation of the zinc dust. This zinciferous ore is of a yellowish brown colour, and represents from 2 to 3 per cent. of the ore treated in the blast furnaces, and yielding 75 per cent. of ZnO, this product entering in the charges of the metallic zinc furnaces. It is most important here to notice that the manufacture of zinc white is not in this case the principal object, but rather the manufacture of spiegel. The zinc oxide being in this instance practically a bye-product, and the quantity entirely in proportion to the demand for spiegel. Before passing into the zinc oxide furnaces the ores containing too much zinc have first to be passed through the smelting furnaces, as it is necessary to rid them of the greater part of their zinc before heating them for cast iron.

What I have said above refers to some ores treated in the United States. No doubt, other ores are treated by the "direct" method, such as calamines and roasted blends. The term "calamine" has two distinct significations: for the mineralogist it is well defined as $2ZnO,\ SiO_2+H_2O$. For the metallurgist the term "calamine" means the various oxidised zinc ores which are often found, viz. the calamine of the mineralogist, willemite, zincite, hydro-zincite ($ZnCO_3.\ 2ZnO+HO_2$), and finally smithsonite ($ZnCO_3$). Franklinite, in that it constitutes an ore peculiar to the United States, is of no industrial importance to other countries. The roasted blend treated in Europe is obtained by roasting sulphide of zinc ore called "blend," having the formula of $ZnS$. The reaction of the roasting operation is as follows:—

$$ZnS+3O=ZnO+SO_2.$$

As you see, the roasted blend enters into the category of the oxidised ores, and can then be used for the "direct" method.

From what I have said one can well imagine that the "direct" method is a most delicate industrial operation, needing a constant supervision of the furnaces and charges. This complication is specially noticeable when one considers the simple nature of the "indirect" method.

### *Other Processes—Precipitation Process.*

This is a wet process, consisting essentially in the precipitation of the hydrate of zinc ($ZnH_2O_2$), from a zinc solution by means of an alkali. This hydrate is collected, washed and dried, and finally calcined to transform it into oxide.

$$ZnH_2O_2=ZnO+H_2O.$$

I will give you an example of this method, starting from the blend which is roasted in special furnaces at a low temperature, in order to form a sulphate and not an oxide.

$$ZnS.O_4-ZnSo_4.$$

This product is treated with water to obtain a weak solution of sulphate of zinc. This solution is concentrated and treated with ammonia in excess to precipitate the iron. The filtrate is then freed from the excess of ammonia by passing a current of steam, which then finally precipitates the hydrate of zinc, which is then treated as I have said above. It is necessary to proceed with a view to recover the maximum amount of ammonia during the operation. This process has never been worked on a large scale, on account of the bad quality of the white zinc obtained. It has no doubt been possible to obtain a zinc oxide very white, absolutely pure, answering to the formula of ZnO, but having none of the qualities necessary to the making of a good pigment. Commercially, this process does not exist, and I only mention it to show that it is not by arriving at the production of a zinc oxide answering to the formula of ZnO that one is certain of obtaining a pigment of any value as paint material.

### *Electrolytic Process.*

Many electrolytic methods have been tried, but up to to-day none have given good results. I will only mention two for your information. The electrolysis of water, with a positive electrode constituted by metallic zinc and the negative electrode by carbon. The oxygen from the decomposition of water attacks the zinc, oxidising it with formation of $Zn\ H_2O_2$. It has been proposed to replace water by a solution of $Na_2\ SO_4$ at 1 per cent. Attempts have recently been made of an electrolytic process with water charged with $CaCO_3$, taking always as positive electrode metallic zinc, and carbon as negative electrode. The first reaction taking place is the decomposition of water and formation of hydrated zinc oxide $ZnH_2O_2$. This hydroxide is then carbonated by the $CO_2$ from the $CaCO_2$ in suspension in the bath. There is a final formation of hydrocarbonate of zinc, which is said to give a product comparing favourably with ZnO. This process is still in the experimental stage.

### *Pyro-Electric Process.*

This process consists in treating in an electric furnace melted zinc ores, mixed with reagents. The exact methods are no doubt purposely not given, but in the opinion of experts it could hardly be a financial success, taking into consideration the exorbitant price of electricity as fuel. As a matter of fact, the price of 10,000 calories with coal is approximately one farthing, whereas, with the electric current, taking the kilowatt-hour at one halfpenny, which is fairly low, you arrive at a price of about 4½*d.*, about 10 times as much. In Sweden numerous trials have been made, but have only resulted in financial failures.

### *Advantages and Disadvantages of the "Direct" and "Indirect" Process.*

Before thoroughly discussing this question, I would like to focus your attention on a point of great importance, viz. that though both have their characteristics, the personal influence of the manufacturers practising them is enormous; I may almost say it is a preponderating one. With the same raw materials and the same methods, two manufacturers can obtain different products; no doubt they will both be zinc oxides having as formula ZnO, but one may constitute an excellent pigment, whereas the other may be worthless. The reason of this phenomenon is known to well-organised factories (some of which I have the pleasure of knowing) who have undertaken the systematic study of the conditions to be realised for a body to constitute a good pigment. These conditions are almost exclusively of a physical order; the micro-structure of a substance plays here a part of greater importance than its chemical nature. It is for having ignored these true principles that many firms are now wedded to inferior products.

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* A paper read on May 12 before the Paint and Varnish Society by Mr. Gaston Depièrres.

*"Indirect" Process.—Real Advantages.*

(*a*) It is possible to obtain by this process a purer white than by any other method. But, in connection with this, it is only logical to remark that the perfectly pure snow white is not very often required; most people describe it as "too raw," "too hard," "too cold," consequently this quality of perfect whiteness should not be overrated. Here is a specimen of two enamels, one made with pure white zinc oxide obtained by the "indirect" method and one made from zinc oxide obtained by the "direct" method; as you will see, the difference is hardly noticeable. (*b*) The "indirect" zinc oxide is of a slightly lighter S.G. than the "direct" ZnO, and is said on that account to be very suitable for making enamel paints. In my opinion, this advantage is of little importance. I have now some enamel paint over 3½ years old, made with "direct" ZnO which has not settled in the least. (*c*) By the "indirect" process in selecting carefully the raw material, it is possible to obtain a chemically pure zinc oxide as specified by the British Pharmacopœia for use in pharmacy.

This, of course, is quite impossible by the "direct" process, where the elimination of impurities cannot be carried out to such extreme limits, but here I can affirm before you, without fear of contradiction by a single competent man, that the slight advantage as regards its purity is of little value in connection with paint making. The "direct" process enables us to obtain white zinc which will give, as regards purity, all the guarantees that one can reasonably expect from an industrial product. In connection with this, I cannot help referring to the specifications of many public bodies who seem unable to rid themselves of their antiquated formulæ on account of their inertia and redtape.

Let me take a concrete example. Supposing that, say, in 1860, one of these administrations had drawn a specification with a clause fixing the maximum amount of lead salts in zinc oxide not to exceed 1 per cent.; this clause, then, might have been a logical one, taking into consideration the chemical and medical knowledge of those days, but when, 20 years later, it is irrefutably demonstrated that even 4 per cent. of lead salts do not constitute any danger whatsoever, from a sanitary point of view—that the pigment is greatly improved and that the price is 15 per cent. less—what will the administration do? There are 90 chances out of 100 that the said administration will continue for another 50 years to send out the same ridiculous specification with the consequence that a large amount of money will be wasted without any compensation whatsoever.

Fortunately, there are to-day many signs that in the struggle for victory men are accepting the logical conclusion from classified facts, viz. that to be advocates and exploiters of pure "this," "that" and "the other," is a relic of past ignorance and doomed to lose its force.

*Disadvantages of "Indirect" Zinc.*

(*a*) The "indirect" zinc oxide is about 15 per cent. dearer than the "direct" oxide, and this difference in price will increase as the raw products—such as the by-product of galvanisation, &c.—become scarcer; this, in my opinion, constitutes one of the future disadvantages of the "indirect" method—so simple technically.

(*b*) The covering power of the "indirect" zinc manufactured in different factories varies greatly, and this variation, I may say, has nothing whatever to do with purity of the product. It is a well-known fact to practical men that certain brands of "indirect" zinc have an inferior covering-power, notwithstanding the fact that makers have made many attempts to remedy this defect. In all cases the covering-power of "indirect" zinc is inferior to that of "direct" zinc. I have prepared here a specimen showing a comparison between the covering-power of white lead (best English made), "indirect" zinc oxide (made in Silesia by a firm of very good repute), "direct" zinc oxide (made in Holland by manufacturers of undoubted capabilities, and well versed in modern methods), and a "direct" oxide (made in America). As you will see the "direct" zinc oxide—made in Holland—and containing 2 per cent. lead salts, easily proves its superiority over all the others. Then comes the Silesian zinc, followed by the American zinc, all of them being better than white lead.

(*c*) I think it is pretty well admitted now that "indirect" zinc, though irreproachable as far as colour and chemical composition are concerned, is inferior in resistance to "direct" zinc, especially when used for outside painting. Exhaustive experiments recently carried out in France, America, Holland, Belgium, all tend to demonstrate this fact. Personally, I have noticed that chalking takes place more or less with "indirect" zinc, according to the brand, whereas with "direct" zinc it is noticeable much later—about 10 per cent. to 15 per cent. being the approximate difference in favour of the "direct" zinc.

(*d*) It will be no surprise to practical men to hear me say that "indirect" zinc in the powder state lacks unctuosity, those who have manipulated both "indirect" and "direct" zinc will understand me, and bear out what I say. I know of some "direct" which, to the touch, gives the impression of a greasy substance, and I am convinced that the unctuosity is a physical state eminently favourable to the combination of the zinc oxide powder with the oil. White zincs well manufactured by the "direct" method are much whiter than the best white lead, and if paint-users in comparing the pigmentary value of white lead with white zinc had had an opportunity of using a well-ground zinc oxide made by the "direct" method, many prejudices against this valuable pigment would rapidly disappear. The value of a pigment, and more so with zinc oxide than with any other, is not defined by its chemical composition, it is, as I have said before, the greatest mistake made by some public bodies and a quantity of buyers. A ZnO may be chemically pure, and yet be a very poor pigment, that is to say, it may not have sufficient affinity for linseed oil to be able to produce a paint which will spread well under the brush, cover the surface satisfactorily, and give a good finish.

*(To be continued.)*

## THE ROBERT GEFFERYS ALMSHOUSES, SHOREDITCH.

THE Parks and Open Spaces and the Local Government, Records and Museums Committees of the London County Council have presented the following joint report:—

We have had under consideration the question whether steps can be taken by the Council to preserve from destruction the old almshouses and the adjacent garden belonging to the Sir Robert Gefferys charity in Kingsland Road, Shoreditch.

The almshouses were erected in 1715 and consist of 14 houses and a chapel. The buildings form three sides to a picturesque garden in which there are some very fine lime trees 200 years old. The almshouses are constructed of yellow brick, with red brick dressings and tiled roofs, which latter were renewed in 1898. The houses possess many of the best characteristics of eighteenth century architectural work of which there are only a few specimens now remaining in London. Their simplicity is one of their chief merits, and, together with the garden, they constitute quite a beautiful treatment of street architecture and garden planning, and they are undoubtedly an important relic of that phase in the history of London which deals with the treatment of the poor under the charitable donations which allowed the provision of almshouses.

The total area of the site is about 1.62 acres. This includes a garden in front of the buildings occupying 1.06 acres, and a disused burial ground at the back of the northern wing of the buildings of about one-eighth of an acre.

An inquiry was held by the Charity Commissioners in 1908 in regard to an application by the Ironmongers' Company, as trustees of the charity, to sell the almshouses and garden to the trustees of the Peabody Donation Fund, who proposed to clear the site and erect model dwellings thereon. The application was opposed by the National Trust for the Preservation of Places of Historic Interest, the Society for the Protection of Ancient Buildings, the Shoreditch Metropolitan Borough Council, and the Metropolitan Public Gardens Association. The Council, although not represented at the inquiry, wrote to the Charity Commissioners stating that it had received a letter from the Shoreditch Metropolitan Borough Council advocating the retention as an open space of as large an area as possible of the garden, and expressing the hope that this aspect of the case would receive careful and sympathetic consideration by the Commissioners. The Charity Commissioners refused to sanction the sale, and, in announcing their decision, stated that they were not precluded from taking into consideration the question of public policy which had been indicated by Parliament with regard to the desirability of retaining open spaces in London and of preserving ancient buildings.

The Court of Chancery, on the petition of the Ironmongers' Company, subsequently ordered an inquiry to be held as to whether it would be for the benefit of the charity that the almshouses and lands should be sold, and, as a result, the Court made an order allowing the property to be sold, on the ground that the only question before it was whether the sale would benefit the charity; and the Court referred it to Chambers to ascertain whether the offer of the Peabody Trustees (amounting to 23,500l.) should be accepted. This offer is about to be formally submitted to the Court, which will doubtless direct the trustees of the charity to accept it unless another offer is made by some responsible body forthwith. If, therefore, the Council desires to preserve these ancient and interesting buildings and to utilise the open space, the only course is to purchase the site.

A deputation from the Shoreditch Metropolitan Borough Council has attended before the Parks and Open Spaces Committee and urged with considerable force that, having regard to the densely populated character of the surrounding district and the lack of open spaces in the neighbourhood, steps should be taken to secure the preservation of the garden. The borough council points out that, while the Metropolitan Borough of Shoreditch contributes its share towards the provision and maintenance of parks and open spaces in London, it receives comparatively little benefit in this respect in the neighbourhood, although it is one of the most densely populated parts of London, particularly that part lying between Kingsland Road and Hoxton Street.

In the Metropolitan Borough of Shoreditch there are less than eight acres of open space dedicated to public use, of which only about three acres is land other than churchyards or burial grounds, the area of the largest being 1½ acres only. The total area of the borough (exclusive of waterways) is about 643 acres, and the population at the time of the 1901 census was 118,637, and is now estimated at 115,000, or about 178 persons an acre. The density of the population in the neighbourhood of the almshouses is about 250 persons an acre, while in the immediate vicinity there is an area, the density of which, according to the census of 1901, is 540 an acre. The infantile mortality is the highest in London.

We understand that both the Ironmongers' Company and the Peabody Trustees, who are interested in the property at the present time, view with sympathy the proposal to acquire the property for public purposes.

The Local Government, &c., Committee have expressed the opinion that the historical interest attaching to the almshouses, taken together with the amenity of the open space formed by the garden attached thereto, is sufficient to render the almshouses worthy of preservation. That Committee and the Public Health Committee reported to the Council on July 6, 1909, in favour of the retention of the almshouses and garden on historical and public health grounds, and the debate which took place on the reception of those reports clearly indicated that the Council was fully in sympathy with the movement to retain the property in its existing state.

The Parks and Open Spaces Committee are greatly impressed with the desirableness of the existing open space being preserved in its entirety, more especially having regard to the extremely congested condition of the district, and to the fact that there is in the neighbourhood no land, other than that now threatened, available for the purpose of a public open space or a pleasure ground. In order that this may be secured, it is essential that the whole of the property should be acquired. The Council has the statutory authority for the purpose in the London County Council (General Powers) Act, 1898, section 60 of which enables the Council to purchase by agreement buildings and places of historical or architectural interest, or to contribute towards the cost of maintaining and managing any such buildings and places; and also possesses further powers under the Open Spaces Act, 1906. By proceeding under these Acts the Council will not only preserve for London buildings of considerable interest, but will, in addition, have at its disposal the great asset of a valuable open space.

The Parks Committee state that by retaining the whole of the existing open space practically no capital expenditure will be necessary in respect of laying out works, and that the annual cost of maintenance is not likely to exceed 200l. There can be no question that the garden will be devoted to the use of the public, and will, if the Council acquires the property, be placed under the management of the Parks and Open Spaces Committee. The question of the use to which the Council can put the buildings must be considered. There are several purposes for which the buildings might be adapted, and the Local Government, Records and Museums Committee will in due course present to the Council a report on this matter.

The estimated cost of the acquisition of the property is, it is true, somewhat higher than that usually paid for such purposes, but in view of the very exceptional circumstances of the case, we feel strongly that the opportunity which now presents itself (and which if not seized cannot possibly recur) should not be lost.

The cost of the acquisition will not exceed 24,000l., but we consider that the Council's contribution should be limited to a sum not exceeding 16,000l., and that the payment by the Council of this 16,000l. should be subject to the contribution of the remaining 8,000l. being made by the Shoreditch Metropolitan Borough Council, or being obtained by that authority from other sources.

## ST. NICHOLAS CHURCH, DEPTFORD.

THIS church, which may fairly be regarded as a national monument, has been found to be in need of extensive repair.

The roof of the nave is sagging badly and the east wall bulging. There are also signs of extensive rotting of the beams supporting the roof. A preliminary estimate by a local builder puts the probable cost at 5,000l., but a more detailed report is being prepared. The church was built in 1697 on the site of a much older structure and is of red brick. The tower is of flint and stone, and dates from the twelfth century. It contains a staircase of Purbeck marble, and a fine peal of eight bells.

Among the ornaments of the church are some fine carvings by Grinling Gibbons. One, a representation of Ezekiel's vision of the valley of dry bones, was found concealed by boarding over the door of the charnel house—formerly the parish mortuary—whence it was removed and built into the wall of the church.

The contrast between the mean exterior of the church and its beautiful interior led a writer in the *Gentleman's Magazine* in February 1795 to remark, "Nothing, surely, can exceed the monstrous incongruity of the church and its tower, stone and brick, Gothic and a defiance of every order jumbled together. Yet its interior is elegant."

Among the men who have left their mark upon the history of their country and who sleep within its precincts are Christopher Marlowe; Peter Pett, the inventor of the frigate, the vessel which laid the foundation of England's sea power; and Edward Fenton, the commander of the admiral's flagship in the fight against the Armada.

## THE ART OF WORKING METALS IN JAPAN.*

PROFESSOR W. GOWLAND said the subject which he was to bring before them was the working of metals in Japan, or rather he should say in old Japan, and it was one of interest. It presented to the metallurgist and the craftsman unique modes of extracting metals and purifying and adapting them by simple processes to both practical and ornamental uses. The metals he proposed to deal with were gold, silver, copper, iron, and tin. They were the only substances recognised as metals proper by early Chinese and Japanese writers, and were technically known as jo-kui, which meant the five metals, and they were supposed to have some mysterious relationship with the five colours and were believed to have originated with the sun and not to be simple bodies or elements, but to be capable under certain influences of being transmuted one into the other. Gold was called the king of the five metals because, as they said, it never rusts and it could be melted many times without appreciable loss of weight, and it was believed that under certain conditions other metals could be converted into gold, but a space of two hundred years at least was required for the completion of change. But much as the acquisition of this alchemic knowledge was sought after no record of transmuting a baser metal into gold had been handed down by tradition. The first discoveries of gold were made in river sand, then mineral veins were worked and the process of extracting gold from quartz commenced. River sand that had been powdered was mixed with water, the water and powdered ore were then passed over a series of cotton troughs, the earthy matter being thus removed from it. The gold washing in Japan was so very skilfully carried on that the washers who worked a river would make it yield a profit in the precious metal when others (foreigners) with modern appliances had decided that it would not pay. Those old gold-washers received no wages, but recouped themselves by the gold dust which adhered to their clothes, and even nuggets would sometimes find their way into the washer's garments.

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* A lecture delivered before the Institute of Metals at the Institution of Mechanical Engineers, Westminster, on Tuesday, May 24.

They found glowing accounts of the gold deposits in the narratives of old voyagers and the richness of Japan in gold generally, but those accounts were all erroneous. The copper used on the temples was covered with a slight coating of gold, and those early voyagers imagined the ornaments were of pure gold, and believed therefore that there must be a large quantity of ore in the country. The effects of laws forbidding the use of gold and silver on the dress had an æsthetic value, which became a mode or fashion, so that the gold jewellery worn about the person consisted of a single gold hair-pin for the women, and in men's use the ornamentation of the pipe or tobacco pouch. The earliest example of its use was seen in the horse-bits belonging to the fourth century and taken from some burial mounds. There were also instances of horses' shoes in copper plated with gold. Then during later times, more particularly after the introduction of Buddhism, copper plated with gold was in demand for ornamenting the exteriors of the temples, and the Shinto temples followed the same custom. It was that lavish display which misled the old voyagers. But the extensive gold mounting did actually require a large supply of gold. The method by which gold was applied to the surface of copper was thus. The object was immersed in plum vinegar, it was then washed and dried over a brazier and gold in the form of leaf worked in. With regard to gold-plating the lecturer said it was quite unknown in Japan in early times, so that in the houses they found nothing of gold except tiny wine cups or the mount of a pipe. The only large vessels of gold were two caskets in the Shinto temple of the goddess Inishi. In 1883 it was decided that one of them should be melted down and replaced by a new one. The casket came to the mint and the melting down was carried through with a priest in attendance. On assay they found that it consisted of about 66 parts of gold and the rest of silver. The golden colour which it had originally, and which led many to believe it was all pure metal, was due to a special process. With regard to gold jewellery there was little of it in old Japan and in no case was copper used as an alloy with gold, the alloy was always silver. Whenever jewellery was made a very high standard of gold was used, but as years went on, and as the gold currency gradually became debased, the standard was lowered until in the last century only 35 per cent., and in some instances only 12 per cent. of gold was employed, but objects made in the lower standard were indistinguishable in external appearances from those wrought in pure gold. It was strange to note that there was no mint in Japan until the sixteenth century; before that time gold circulated as currency in the form of dust carried about in quills or in small paper packets. The first coin struck was valued at about 16 guineas and contained several ounces of gold. In addition to the production of coins it was also the function of the mint to prepare gold bars called homar, which were kept in the treasury as a reserve against pestilence or war. The bars were about 13 inches long and 5 inches broad, and 5 inches thick. The assay of the gold bars was all done by the process of the touchstone, no acid being used. The method was a most successful one to employ when the alloy was silver and in Japan they had been able to get within ten parts of gold in a thousand. There were other methods practised in order to determine whether there was too much copper in the gold or silver alloy. Gold was only alloyed with silver and not with copper, so that the coins were nearly all white or faded colour. It became necessary therefore to give them a surface of gold, and that was effected by dissolving out the silver in the upper surface of the alloy. Another process, and one followed by all the modern jewellers, was to plaster over the object and mixture of the alloy, heating it to redness and then afterwards washing it in a solution of sulphur chloride. Silver was called by the Japanese the white metal, and it had been in use among them from very early times and two or three centuries before our era. The earliest specimen of silver seen by the lecturer was a bowl belonging to the eighth century, about A.D. 766. Silver was used but seldom for their religious vessels and utensils, and when used it was generally gilt, so that they had only specimens of coinages and a few sword mounts surviving the early periods. After the civil war silver came largely into use for making sword ornaments, pipe bands, and ladies' hairpins, but these articles were not made so much in pure silver as in an alloy of silver and copper. The methods for assaying the standard of metal were very closely analogous to those employed for gold—99.7 per cent. was the general average of the assay. Silver in the old days of Japan was used in that pure state, but later on copper was added, firstly because it was difficult to cast pure silver, and secondly because pure silver was not sufficiently hard. Yet the ornaments generally showed 94 per cent. and some 97 per cent. of pure silver. Later, and especially during the last century, a large quantity of debased coins became current, and the jewellers made articles of the same metal. Silver was cast by being melted in earth furnaces with charcoal fires and cast in troughs in linen moulds under the surface of water. Linen moulds were used so because when cast in water the surface of the mould was always clean and the silver was not coated with oxide of copper. When debased silver was to be used the colour was not good, and to remedy that defect it was heated to redness in a brazier over a fire and plunged into vinegar. The process was still very largely employed, and deceived people, since it made the object appear to be wrought of true metal when it was debased. The largest works of the art metal workers were not as a rule carried out in pure gold or silver, but were fashioned in alloys. Their art was best displayed in the peculiarly Japanese alloy known as spakisdo, containing gold, silver, copper, lead, iron, and arsenic. In order to obtain the best results in colouring a percentage of no less than 3 per cent. of gold was introduced. Shakudo was especially Japanese. It had deep rich tones of black, was capable of receiving a splendid polish rendering it alike a good substance for casting and a perfect ground for inlay in designs of gold, silver, and copper and for being similarly inlaid in tin. The appearance of this alloy was quite superior to any of the old Chinese alloys. When first cast it had the appearance of gunmetal, but it was treated by a special process to obtain the fine violet sheen which distinguished it. The lecturer said it might interest them to know that the Japanese were still adding to their number of alloys. Latterly a variety of shakudo had been introduced by the chief assayer at the mint and formerly the lecturer's first assistant there, which contained no gold. This new alloy was used for the preparation of medals for the soldiers who took part in the war with China. It was made from the old bronze guns taken from the Chinese, but so that the medals should not have the appearance of copper coins the bronze was melted and mixed with a small quantity of iron-arsenic spice. The medals after being struck were carefully burnished and boiled in a solution of copper sulphate, verdigris, and water. That alloy almost rivalled shakudo, and it was one which might well be copied by Western nations. There was a silver alloy called shibuchi. Most of the best works were made of it, the composition being one part of silver to two of copper. The value of the alloy in decorative work was entirely dependent on its patina. It possessed no special beauty when cast, but after the surface had been subjected to treatment the patina took on a delicate grey and was a beautiful ground for inlay. It was produced by precisely the same process as shakudo. Copper or as it was called red metal was really the metal par excellence of Japan because its applications were more numerous than in any other country, and in many respects quite unique. It was first employed for ornamenting the cheek plates of their horses' bits. With regard to the treatment of the ore to produce the copper, various curious methods in the smelting were followed by the Japanese. The furnaces employed were those which had been in use from early times, though during the last century the furnaces were of greater magnitude. One of the necessaries of the smelting was the bellows, and the Japanese used a box bellows worked by men. The furnace was put in the ground, and it was so simple that he recommended it to prospectors who might be engaged in opening up a mineral vein. With regard to the use of copper in Japan a very large quantity of it was employed for round water spouts, roofing, and ornamental architectural plaques, and as a constituent for bronze. The casting of bronze presented one or two interesting features. In the first place every bronze piece or large vessel was cast without a bottom, because there was a core to the vessel to be modelled. Big bells and images were cast *in situ*. The alloys used varied considerably from 70 to 81 per cent. of copper, and nearly all the bronze contained certain portions of arsenic and antimony in order to give hardness and in some cases to give a special patina. With regard to the patinas, and especially the best ones, the rich effect was due to the lead present in the alloy. In conclusion Professor Gowland paid tribute to the intense love of art with which the Japanese had been imbued for centuries past, and the enthusiastic appreciation of faithfulness in all work. Those qualities had made every workman and craftsman an artist, and hence the patience and marvellous skill bestowed even upon articles for domestic purposes. The modern Japanese worker in metals, owing to the pressure of Western competition, was working in an adverse environment to those who in the early centuries were stimulated by religious fervour. But the old art was only dormant and not dead. The number of craftsmen was increasing, and during recent years the Emperor had done much to encourage its revival, and some of the modern work carried out at the Imperial Palace was equal to the best of the earlier periods.

## ANCIENT LIGHT CASE.

THE action brought by Mr. Alexander Murray Smith, proprietor of Nos. 40 and 42 Queen Anne's Gate, against the Anglo-American Oil Company, for an injunction in respect of an alleged obstruction of ancient lights, was again before Mr. Justice Joyce in the Chancery Division on May 25 and 26.

Mr. Hughes, K.C., for the plaintiff, reminded his lordship that the action came on for hearing on February 1 last, when an order was made directing Mr. John Slater to inspect and report upon the matter for the assistance of the court. Mr. Slater had made his report, and it came before the court now for the parties to discuss and see how far they accepted or questioned it. The old houses opposite, upon the site of which the defendants were erecting new premises, had been of considerable height, and the plaintiff's houses, which were low, had never been well lighted towards the north. The street was a narrow one—30 feet wide at the eastern end and 25 feet at the western end. The complaint made was that the proposed new building of the defendants went higher than the old houses, and that the non-sloping part of the roof was much greater in extent than formerly, and further that the building was taken towards the westward 5 to 6 feet beyond the old premises. In other words instead of having a rounded end it was brought out to an acute angle about 5 feet 6 inches further to the westward. The new roof was almost entirely composed of dormer windows so that plaintiff did not get the advantage of the slope. Counsel proceeded to read Mr. Slater's report, which stated that with respect to No. 40 the first floor windows were affected to the extent of four and the second floor windows five degrees by defendants' new building, and that three windows in No. 42 were affected in precisely the same way. The kitchen of No. 40 was affected to the extent of 10 per cent. On the other hand Mr. Slater thought that plaintiff's houses would get more reflected light from the white building of the defendants than from the old red brick premises which had been pulled down, and came to the general conclusion that the access of light enjoyed by plaintiff's houses would only be interfered with to a slight extent, and that the houses would not be rendered in a sensible degree less comfortable and convenient than they were before.

Counsel said he recognised that upon this report he could not usefully renew his application for an injunction, but he submitted that the result of the report was that there was a material reduction in the light coming to plaintiff's houses considering how inadequately they were lighted under the old conditions and that Mr. Smith was entitled to some damages or compensation for the obstruction of his light. With respect to the reflected light Mr. Hughes said this was a very poor substitute for the real thing, and that white stone in London buildings turned black very much sooner than red brick. In the course of a very short time Mr. Smith would have a black building instead of a white one opposite him.

Without calling upon Mr. Younger, K.C., for the defendants his lordship dismissed the action with costs.

## INCORPORATED CHURCH BUILDING SOCIETY.

THE above Society held their annual Court on Thursday, May 26, at Church House, Westminster, under the chairmanship of the Archbishop of Canterbury.

The ninety-second annual report showed that on nearly all the items of receipts there had been an increase in income during the year 1909 over that received in 1908, the total being 7,862*l*. against 6,998*l*.

The past history of the Society shows that it has been instrumental in aiding in the erection of no less than 2,603 additional new churches, and in assisting in rebuilding, enlarging or otherwise improving the accommodation in 6,654 other churches or consecrated chapels-of-ease. By these means more than two million additional seats have been secured, far the greater part of which are for the free use of the parishioners according to law. The actual amount of money entrusted to the Society and used in making grants toward the objects named has reached 931,321*l*.

In the last annual report the Committee called attention to the fact that the "Occasional Notes on Church Furniture and Arrangement" had been reprinted and published in pamphlet form. These articles were originally contributed to the Society's quarterly magazine, *The Church Builder*, by the eminent architect and antiquary, the late Mr. J. T. Micklethwaite, F.S.A., who was for many years a member of the Committee of Honorary Consulting Architects of the Society and Surveyor to Westminster Abbey. The Committee strongly urge that all lovers of Church architecture should carefully study these valuable articles, and do all in their power to ensure their wide circulation. If this be done, the Committee feel that the high standard in Church building which the Society fosters, and which Mr. Micklethwaite did so much to promote, will be maintained. A copy will be sent post free for 7½*d*. on application to the Secretary of the Society.

In accordance with a resolution of the Committee a copy of the pamphlet was sent to the Archdeacons and the Chancellors of England and Wales, and many letters of thanks were received bearing testimony to the great value placed upon the articles by those to whom they are of peculiar service.

The series is being continued in *The Church Builder* by Mr. W. D. Caröe, M.A., F.S.A.; and among the articles which have recently been included are two bearing the title, "A Manual of 'First Aid' for Archidiaconal and other Inspections." These were suggested by a clerical member of the Society who felt the need of such expert guidance. The "Manual" has lately been reprinted and published under one cover.

During the past year the Committee of architects reported to the Committee that it had for some time been evident to them that certain alterations were desirable in the paper of "Architectural Requirements and Suggestions." Owing to the greatly extended use of concrete and asphalte at the present day it was felt that the requirements of the Society should be brought up to date, and further, that some minor alterations as to thickness of walls, width of steps, &c., under certain conditions could be made without detriment, so as to give some relief to the many applicants for grants who now consider the Regulations somewhat too stringent.

After careful consideration the proposed modifications were adopted and the revised paper is shortly to be circulated.

It was further felt essential that in order to encourage the better planning and design of the churches brought before the Society the following words should be embodied in Rule xxi., "Good planning and design will have considerable weight in determining the amount of the grant to be made by the Society."

In consequence of it being found that detrimental alterations are frequently made in the arrangement of churches aided by the Society's grants after the plans have been finally approved, the following words have been added to Rule xxxi. of the Society at the suggestion of the Committee of architects:—"Grants are made on the distinct understanding that there shall be no deviation from the plans sanctioned in the arrangements of a church aided by the Society without further consultation with its Committee."

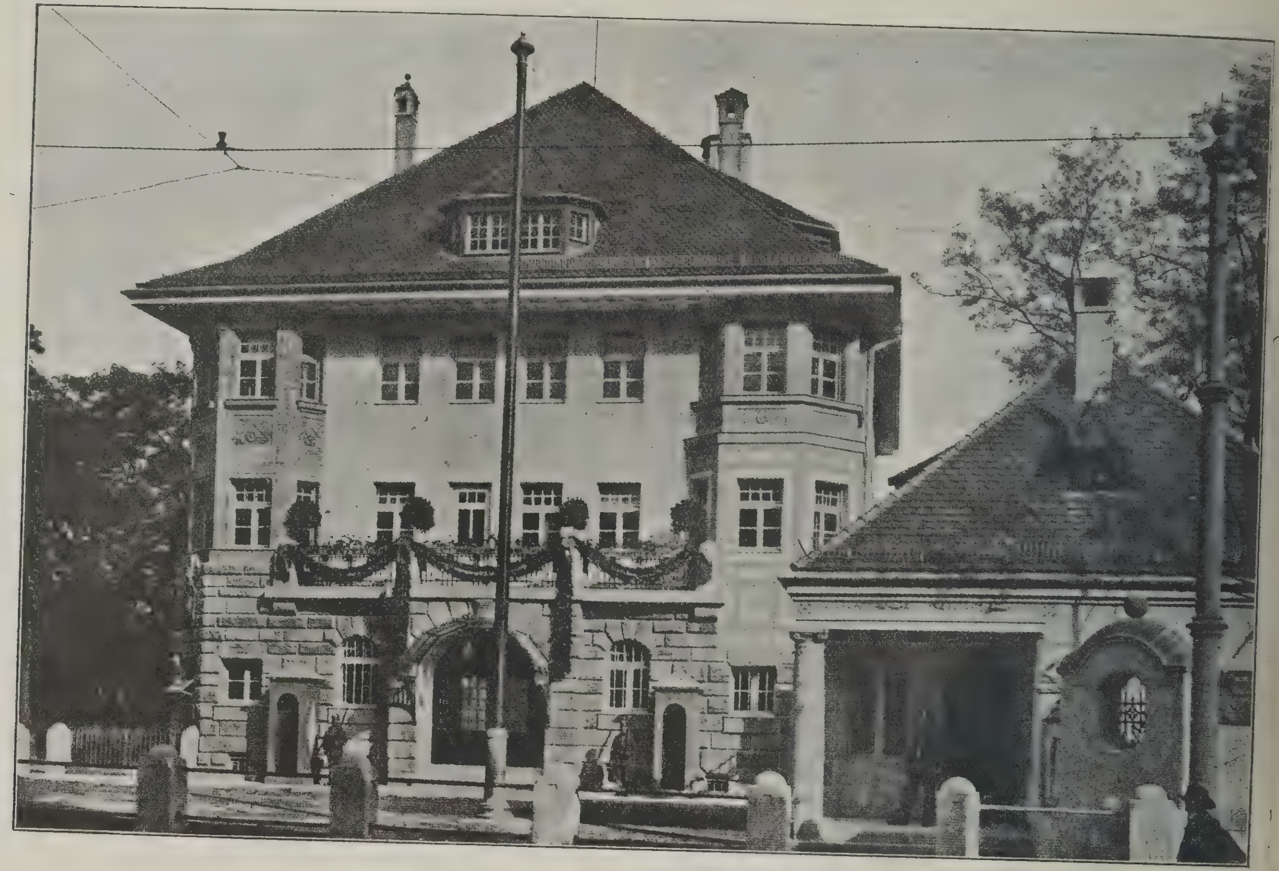
The Honorary Consulting Architects are as follows:—W. H. Bidlake, Esq., M.A., W. D. Caröe, Esq., M.A., C. Hodgson Fowler, Esq., C. H. M. Mileham, Esq., Temple Moore, Esq., Sir C. A. Nicholson, Bart., E. S. Prior, Esq., G. H. Fellowes Prynne, Esq., J. Oldrid Scott, Esq., R. Norman Shaw, Esq., C. S. Spooner, Esq., E. P. Warren, Esq., and Sir Aston Webb, C.B., R.A.

Sir Charles A. Nicholson, Bart., moved the adoption of the report, and in the course of his remarks said:—We members of the Architects Committee are sensible that it is a privilege to take our part in the work of this Society. The Society's influence is far greater than might be expected considering the relatively small sums it is in a position to grant in most cases. In a way its work may be compared with that done by the old "Ecclesiological Society" of the second half of the last century. It is largely to the influence of the Ecclesiological Society that we owe that fine series of churches by Butterfield, Street, and other masters commencing with the wonderful church in Margaret Street, built at a period when the popular ideal of ecclesiastical art was a pile of common brickwork faced with rude ragstone with skimpy varnished deal roofs, long rows of pews, and texts round the arches. Thanks to the exertions of men like Beresford Hope, and to the example of artists like Butterfield, Sedding, and Bodley, I think we may say that the general level of modern church work is higher than it was 25 years ago. But for all this I doubt if we build very many churches nowadays that are worthy of comparison with the best productions of the last half of the nineteenth century. I refer to such buildings as St. Alban's, Holborn, All Saints, Clifton, the church at Hoar Cross, or St. Agnes, Kennington. And although much good work comes before the Architects Committee, there are a great many designs we are asked to criticise which it is not too much to say it is difficult for us to pass without regret.

In the case of a new church it is not our province to

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Der Profanbau.*

HEADQUARTERS OF THE COMMANDANT OF GARRISON, NUREMBERG.—Baurat G. Kurz, Architect.

reject a merely commonplace and unintelligent design unless it is structurally defective; but in cases where grants are sought in aid of "restoration" work it is, it seems to me, our clear duty to prevent, as far as lies in our power, the waste of funds to which the Society is asked to contribute upon doing work which is either unnecessary or even Grimthorpean.

Take the case of some old village church, possibly covered externally with roughcast a couple of centuries old, with a weatherbeaten tile roof and a rough floor of old bricks and gravestones. A new vicar is appointed, and some architect called in who proposes to set up a new deal roof covered with brittle Broseley tiles of mathematical hideousness, to reglaze all the windows with that monstrous invention called cathedral glass, to strip off the old plaster and reface the walls with flint or what not, at a vast expense by the way, and to convert the interior by means of some pitchpine furniture and a smart tile floor into the semblance of a ritualistic chapel-of-ease in a seaside resort. The aid of the Society is sought for this laudable purpose; but is it fair that the Committee of architects should wink at your hardly-collected golden sovereigns being so expended?

I think there is a general idea among architects who do not get many opportunities of church building that your Committee of architects are rather hard taskmasters. Well, as I have said, we get all sorts of schemes to criticise, and, subject to their being workable schemes, we have no choice but to pass them. Sometimes, but very rarely, a scheme is hopelessly deficient, and in such cases we can only decline to make any report. But wherever there is the least chance of bringing a scheme up to the Society's standard, I think I may safely say that the Committee spare no pains to attain this end.

Again, on one or two occasions we have had really fine schemes before us, admirably designed both in mass and in detail, but obviously the work of men without much previous experience of church work, and not entirely conforming to the rules of the Society. In such cases a long list of criticisms may have been made; but such criticisms should never be misunderstood as in any way reflecting on the architect who has prepared the design. Rather are they a compliment to his genius—the work may be so good that it is worth criticising, worth taking trouble over, not a crass, dull thing that no criticism can ever raise above the uninspiring and commonplace. In such cases as these it seems to me that it would be well for the Committee of architects to express its appreciation of the aims of the designer even though it may be advisable to recommend alterations either for structural reasons or for purposes of convenience.

I now wish to say a word on the subject of cheap churches. The Society has rightly laid down a schedule of requirements as a condition of its helping any scheme. But I regret to say that there are certain church builders who habitually exercise an almost uncanny ingenuity in fulfilling the letter of the Society's requirements in order to secure the Society's grants, and, what is even more valuable to them, the prestige of the Society's approval of their undertakings. It would, I venture to suggest, be well if the Committee of architects were empowered to condemn schemes in which obedience to the letter of the law obviously covers a disregard of its spirit, and, conversely, if they were free to pass plans in which the literal fulfilment of all the Society's requirements is not in their opinion necessary, as no doubt is the case in many instances which may be quoted.

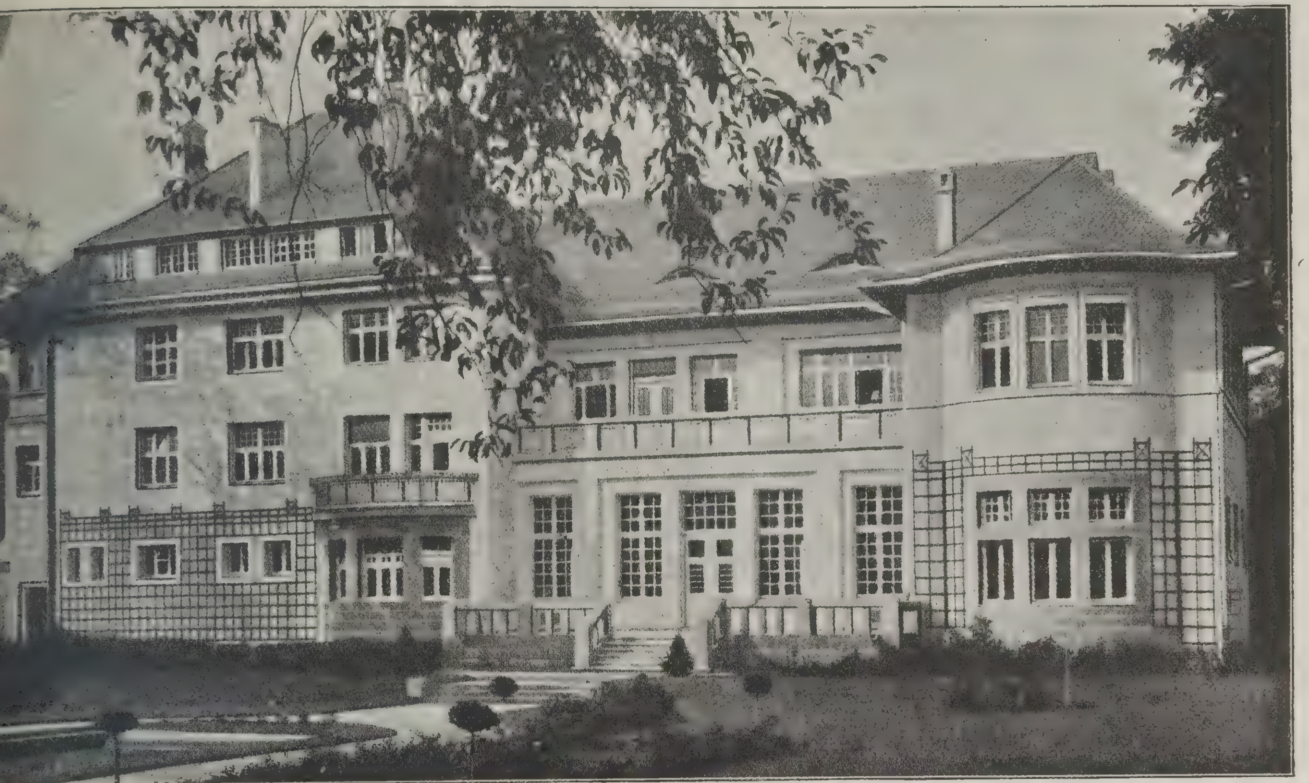
I take it there is no harm whatever in building a cheap church, provided it be solid and sufficiently spacious. The harm comes in when people try to build showily as well as cheaply, when they starve the roof tree so that they may gild the altar, when they cram seats into every odd corner in order to swell their "tables of accommodation," and where they juggle with the number of pounds they must pay "per sitting," a form of trickery wasteful in the long run, as many have found to their cost.

In this matter I fear the regulations of the Society have something to answer for. Its grants are based upon the number of sittings provided, which affords a distinct temptation to all of us architects to spoil our churches by overcrowding them for the sake of getting a big grant from the Society and of acquiring merit in the eyes of building committees. They certainly manage these things better abroad, where the modern churches are roomy and spacious, where one can breathe in comfort, and if one likes sit behind some pillar sheltered to a certain extent from the full blast of musical and other aids to worship.

Would that we had more such churches here; perhaps the Society could do something by basing its grants not upon

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Der Profanbau.*

GARDEN FRONT, COMMANDANT'S HEADQUARTERS, NUREMBERG.—Baurat G. KURZ, Architect.

the actual number of seats provided, but on the cubic space enclosed within a church—for I think the average building committee will be found quite anxious enough to overcrowd a small church without being aided and abetted by any society such as this.

As regards the largeness of our ideas in the present day I fear we do not compare over favourably even with our grandfathers and great grandfathers. For instance, I read that St. Pancras Church cost over 70,000*l.*, and that the velvet hangings of its pulpit and reading-desk cost no less than 567*l.* Of course, this was in the days of church rates, and at a time when a dozen churches were building where now we should be building a hundred. Still these things give us food for reflection. And if we cannot afford to build handsomely, then at any rate let us build simply and modestly. And when we have got our churches, which in nine cases out of ten have to be cheap ones, do not let us bedizen them with the brazen birds and the sentimental windows which the clerical tailors are ever at our elbows to supply.

## THE LATE SIR THOMAS DREW, R.H.A., F.R.I.B.A.

AT a meeting of the Royal Institute of Irish Architects lately held at their chambers, South Frederick Street, Dublin, it was determined that a suitable tablet should be erected at St. Patrick's Cathedral to the memory of the late Sir Thomas Drew, for many years President of the Irish Institute and Royal Hibernian Academy. The expense will be borne by the members of the Institute in general.

Mr. R. Caulfeild Orpen, F.R.I.A.I., has been appointed architect to the Dean and Chapter of Christ Church Cathedral, Dublin, in succession to the late Sir Thomas Drew, with whom he worked in conjunction for many years past.

## COMPETITION RESULT.

IN the competition for new grammar school at Otley, Yorkshire, there were 30 competitors, and the assessors, J. H. HALLAM, Esq., of the West Riding County Council, and Messrs. WILLINK & THICKNESSE, of Liverpool, have awarded the premiums as follows:—First, Mr. WALTER H. BRIERLEY, of York; second, Messrs. OLIVER & DODGSHUN, of Leeds; third, Mr. J. T. HALLIDAY, of Manchester.

## NEW ENGLISH ART CLUB EXHIBITION.

LAST year the New English Art Club migrated for their winter exhibition from wofully deficient premises off Bond Street to the galleries of the Royal Society of British Artists in Suffolk Street, Pall Mall. This year they again occupy these quarters for their summer exhibition, and show nearly three hundred pictures, not merely without overcrowding, but with an actual appearance of spaciousness. The walls are so well arranged that everything is within range of easy vision, and the quality is so high as almost to make the visitor wish the works had been packed a little closer so as to make room for more. The New English Art Club have held forty-two exhibitions, and have established for themselves a notable position. Their forty-third will not disappoint those who have come to look on the society as a half-way ground between the ideas of the old and the new. This latest exhibition is exhilarating to a degree, and shows that Burlington House does not reflect every vital force in contemporary national art. Picture after picture delights with its revelation of freshness, spontaneity and power. There is little that is jaded, for each and every picture seems to bubble over with vitality, and the spirit of adventure. These qualities were perhaps to be expected in the work of artists like Mr. John S. Sargent, Mr. William Orpen, Mr. P. Wilson Steer, Mr. William Shackleton, and Mr. H. Tonks, who have in the past achieved a high reputation. All the other painters, however, appear to have been similarly compelled to reach forward and catch new modes.

If there is one outstanding figure among the exhibitors it must be that of Mr. John S. Sargent, R.A. This wonderful artist shows no less than six works, and none of them are portraits. The place of honour in the central gallery has been accorded to his "The Church of Santa Maria della Salute," which is an architectural painting if there ever was one. The church must have been represented thousands of times for, as the late Mr. W. J. Anderson wrote, "its exterior effect is the delight of painters, and a familiar object in most representations of the scenery of the glorious sea-gate to the presence chamber of the Queen of the Adriatic." Mr. Sargent, however, was not wishful of merely adding another to the charming pictures of the church in its beautiful setting. He concentrated his skill on the angle of the pillared entrance with its flight of steps, and the first of the chapels. As a tour-de-force the picture must win unqualified admiration, and the Johannesburg gallery will be richer for this acquisition. His large "Florentine Nocturne" reveals skill and poetic feeling of another sort. The subject is Cellini's famous statue of Victorious Perseus in the Loggia dei Lanzi, silhouetted against the star powdered cerulean vault, and it is one of those mental impressions which bring a man a lifetime's pleasure. In the mystery of its setting the nude figure seems imbued with life as it holds aloft the severed head of Medusa. Mr. William Orpen is another notable contributor with five works, each of which is unlike the others. His portrait of Mr. Alfred W. Rich portrays his fellow artist in unconventional garb sketching; "A Woman" shows a prostrate nude figure daringly posed, and looking with entreaty to be freed from her uncomfortable position; "On the Irish Shore" and "The Rest" are just a little puzzling, for as they stand they are scarcely ordinary Hibernian types. Mr. P. Wilson Steer's only large work is this year a clever portrait subject "The Muslin Dress," a girl half lying on a chintz-covered sofa; the pose may not be the most graceful possible, but the work is extremely pleasing in its lack of affectation. Another portrait subject which is eminently successful is "A Window by the Thames," by Mr. W. W. Russell. The art of Mr. William Shackleton has its own enthusiastic admirers, and here they will find seven of his characteristic works. The two first rooms are devoted to a somewhat miscellaneous mixture of watercolours, drawings, and etchings. The series of caricatures by Mr. Max Beerbohm, for instance, makes a curious contrast to the clever drawings by Mr. Muirhead Bone. These rooms may be said to serve as a hors-d'œuvre to the rich, though wholesome fare which awaits the visitor in the remaining galleries.

## CROSBY HALL, CHELSEA.

IT is just three years ago since a committee of the London County Council reported that in consequence of the imminent danger of the demolition of Crosby Hall, Bishopsgate, they were considering whether the Council ought not to exercise its powers to purchase such a building or to contribute towards its preservation or maintenance. Crosby Hall, it may be remembered, was erected in 1466 by Sir John Crosby, an eminent grocer and woolstapler. According to Stow the new house was "of stone and timber, very large and beautiful, and the highest at that time in London." Crosby's Place had during the next two centuries a succession of distinguished tenants, including Richard, Duke of Gloucester, afterwards Richard III.; Lord Mayor Sir Bartholomew Reed; Sir Thomas More; and the Dowager Countess of Pembroke. At the end of that time its greatness began to diminish, and in 1676 when all the buildings with the exception of the great hall were burnt to the ground the occupants used it as a Nonconformist meeting house. In 1836 a public subscription was raised to save the dilapidated structure from destruction, and thirty years later it was again restored preparatory to its being used as a restaurant.

But a still more momentous change in its fortunes came some three years ago, when the Chartered Bank of India, Australia and China acquired the site for the purpose of erecting new premises. A movement which had the expressed approval of King Edward VII. was quickly inaugurated to raise 150,000*l*. for the purpose of its preservation; of this amount 50,000*l*. was to be spent on the purchase of a contiguous freehold site on which the Bank could erect their premises, and 60,000*l*. on the purchase of leasehold interests. The directors gave instructions that until the success or failure in raising the funds was assured only those parts of the premises which were unimportant should be demolished, and that even that work should be carried out with the utmost care. Accordingly the contract was let to Messrs. Trollope & Colls, in preference to an ordinary housebreaking contractor, on the recommendation of Messrs. Gordon & Gunton, the architects. Subscriptions were promised up to 60,000*l*., and there they stopped. As a last effort a sub-committee of the London County Council were instructed to ascertain if arrangements could be made either to preserve the hall as it stood, or to re-erect it or any part of it on another site, to which the public could have access. But as neither that body nor the City Corporation, nor any of the societies interested were prepared to contribute the balance of 50,000*l*. their moral support was of no avail, and the work of demolition was continued. Fortunately the bank directors arranged for the preservation and temporary storage of the most interesting portions until they were handed over to the County Council in 1908. The Council finally acquired them in connection with a scheme put forward by the University and City Association of London, by which it was proposed to re-erect Crosby Hall in Chelsea at More's Gardens, at their own expense. Here it will serve as the college hall in connection with the University settlement proposed to be erected at a cost of 60,000*l*. on the site, and also as a public hall. This proposal was quickly adopted.

The new old Crosby Hall was thrown open by Messrs. Trollope & Colls, the contractors, for the inspection of architects and others last week. As it stands at present it seems a somewhat isolated structure; but when the whole settlement is complete it will form a striking feature of this group of collegiate buildings. Though the important parts of Crosby Hall are the same as in Bishopsgate there is nevertheless a fairly considerable portion of it that is new. The walls, for example, were of rubble and in consequence they had to be formed mostly of new brick plastered over up to the height of the windows. The windows themselves are of the original stone, as is also the remarkably beautiful bay window. The latter is formed of 131 separate pieces of stone each of which was elaborately marked before being taken down from its original position. The famous carved roof is practically intact. Before re-erection, however, the timbers were pickled, and the numerous coats of paint and varnish removed. The great stone fireplace faces the bay window. At one end a new concrete gallery has been put up. The floor is of wood, and is new, the old stone floor being too much damaged. The exterior is conspicuous for its bright tiled roof, its finely shaped chimney stack, and the hexagonal wooden turret and vane rising in the centre. The whole structure is over a roomy basement 15 feet high.

The University students have an historic building in which to foregather, and London has the right to share it. But there is nothing distinctively fifteenth century about it, for the building as it now stands might have been designed by an architect with one eye for his late Gothic forms and the other for his practical requirements. The work reflects great credit on Messrs. Trollope & Colls, who carried out the re-erection as well as the removal. The architects for the scheme were Messrs. Wratten & Godfrey.

## OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) illustrates the First National Bank of Hoboken, N.J., by Mr. Kenneth M. Murchison, a refined piece of Classic work; two good houses of moderate size, one for Mr. Samuel H. Austin, at Chestnut Street, Philadelphia, by Mr. Charles Barton Keen, the other at Mt. Kisco, N.Y., by Mr. W. S. Phillips. Mr. Keen seems to be an expert in pergolas, as an extensive one at Walnut Grove, near Bristol, Pa., by him, is fully shown, and he adopts a similar motif for verandahs to a house at Langhorne, Pa. Several designs by students of the Society of Beaux-Arts Architects are also illustrated.

*La Construction Moderne* (Paris) devotes its illustrations to a house in the Rue Cassini, Paris, by M. F. Saulnier, which is an excellent example of "art nouveau" void of eccentricity.

*Stone* (New York) shows us the new chapel at United States Military Academy, at West Point, a remarkable piece of quasi-military architecture, with windows of Perpendicular tracery, of which Messrs. Cran, Goodhue & Ferguson are the architects. The new chapel of the United States Naval Academy at Annapolis is also illustrated. This is a finely designed domed structure on a Greek cross plan by Mr. Ernest Flagg.

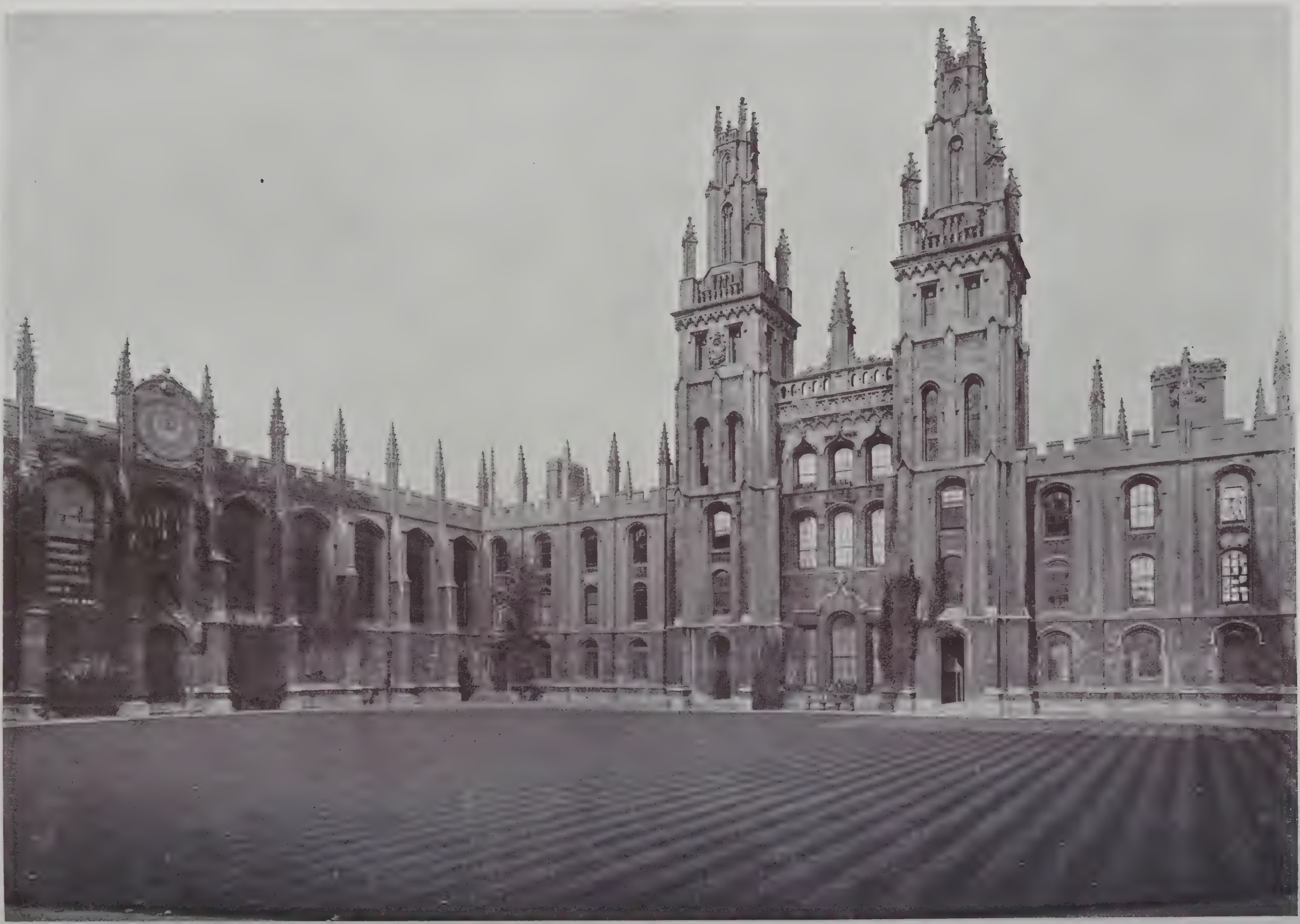
*Engineering Record* (New York) gives an interesting account of the underpinning of a 300-ton column on quicksand in the Sargent Building, a seven-storey brick warehouse at Centre and Leonard Streets, New York.

*Het Huis* (Amsterdam) contains the fifth of its series of articles on Oud-Deventer, that wonderful storehouse of sixteenth, seventeenth, and eighteenth century Dutch architecture. There is also an appreciative article on an exhibition of Old English crewel work now being held in the offices of our contemporary.

Professor Schuster has purchased and presented the painting "Olive Gathering," by J. S. Sargent, R.A., to the Manchester Art Gallery.

Messrs. Wood & Kendrick have been appointed architects for the new school to be erected by the local education committee in Oxhill Road, Handsworth.

An immediate appeal is to be made for 40,000*l*. for the purposes of the restoration, maintenance and endowment of Southwark Cathedral.



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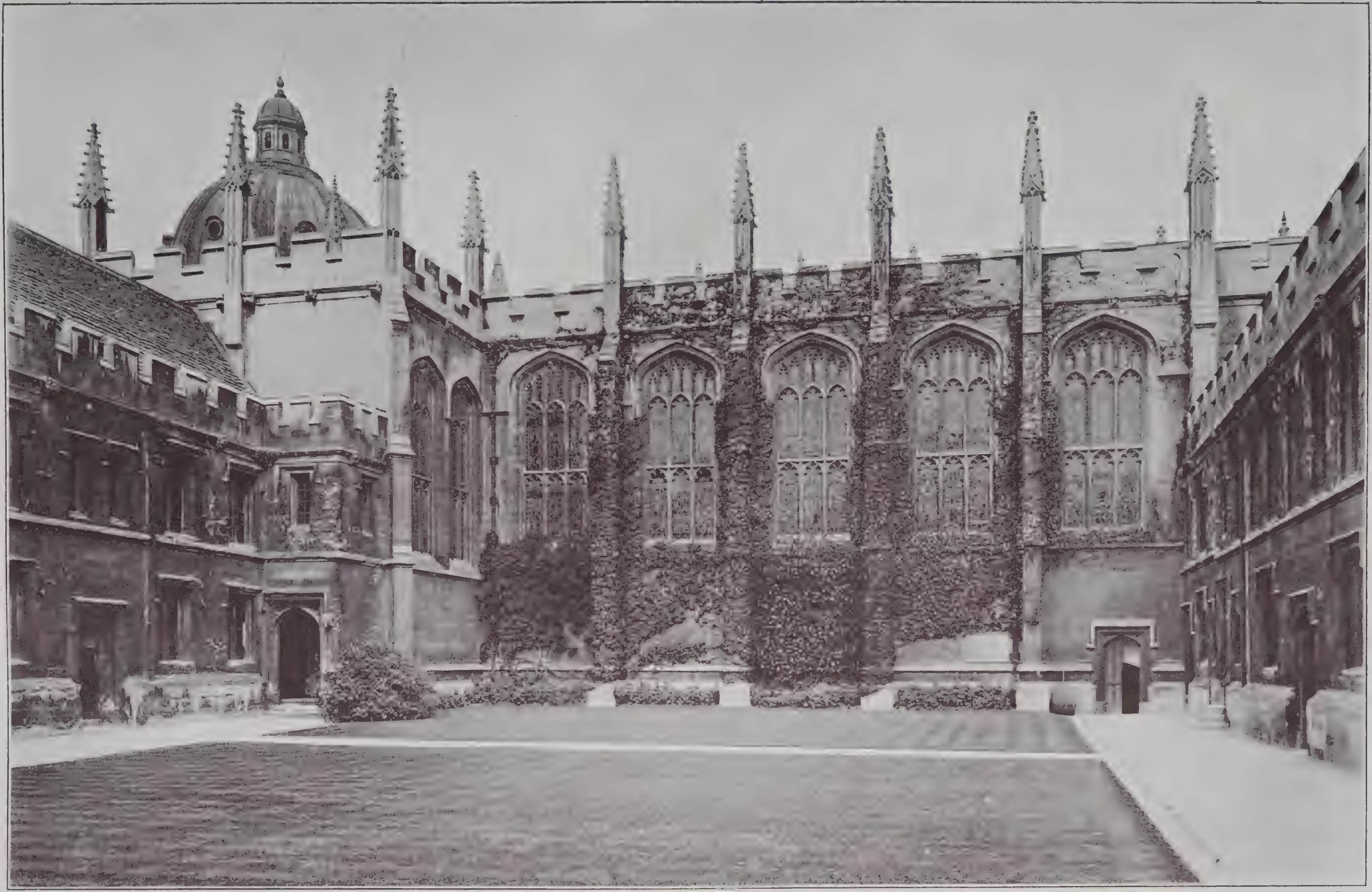

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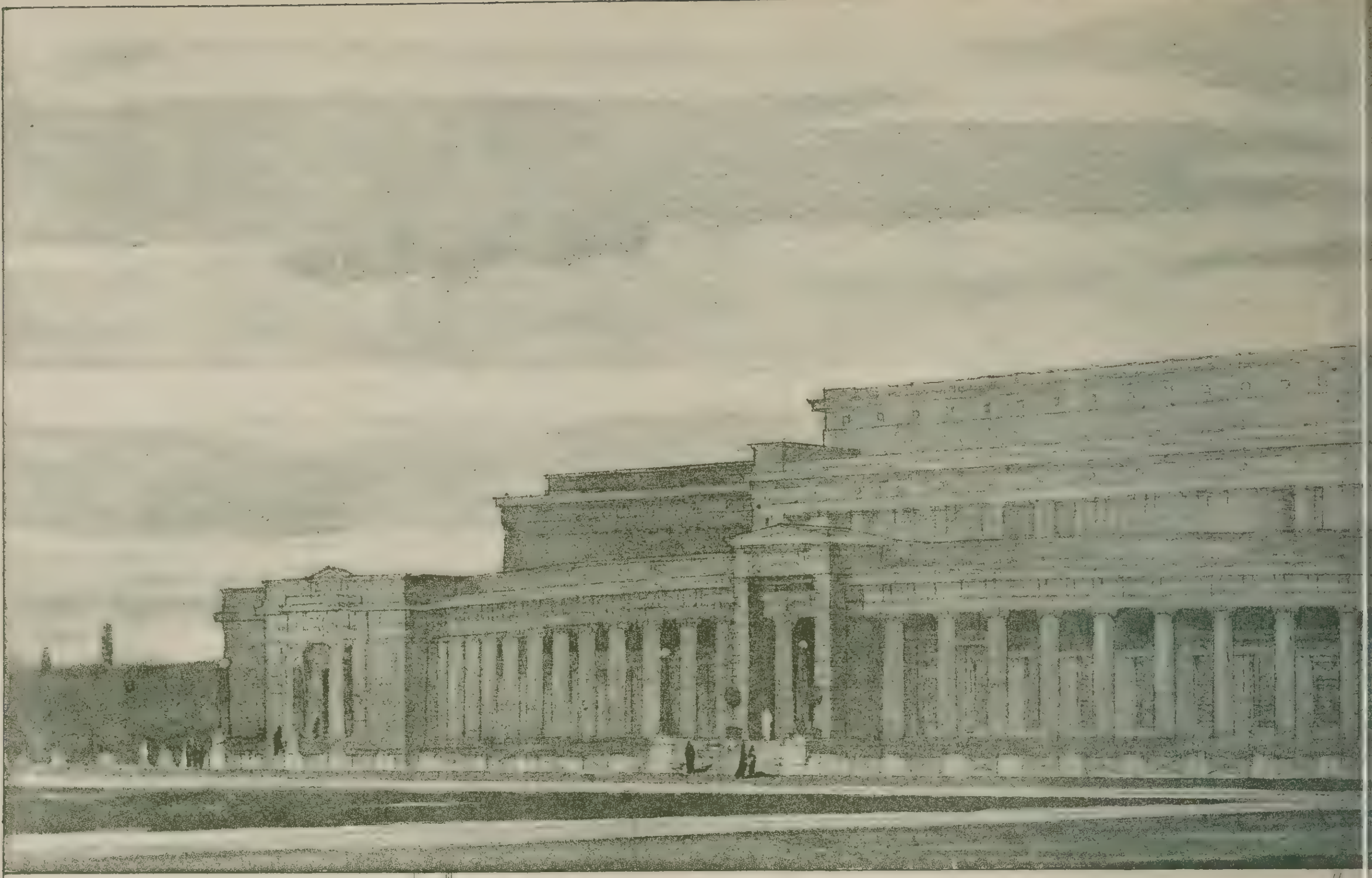

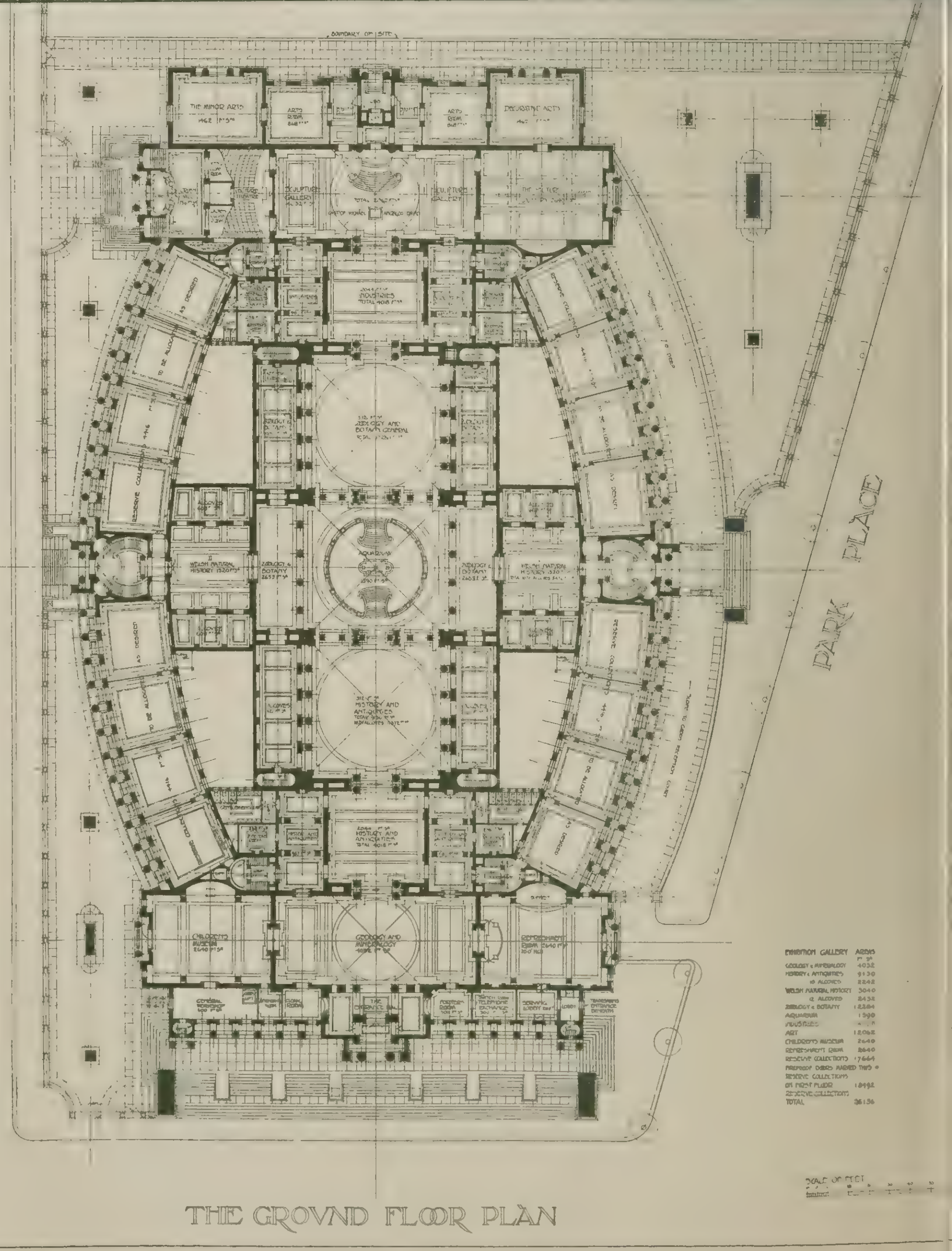

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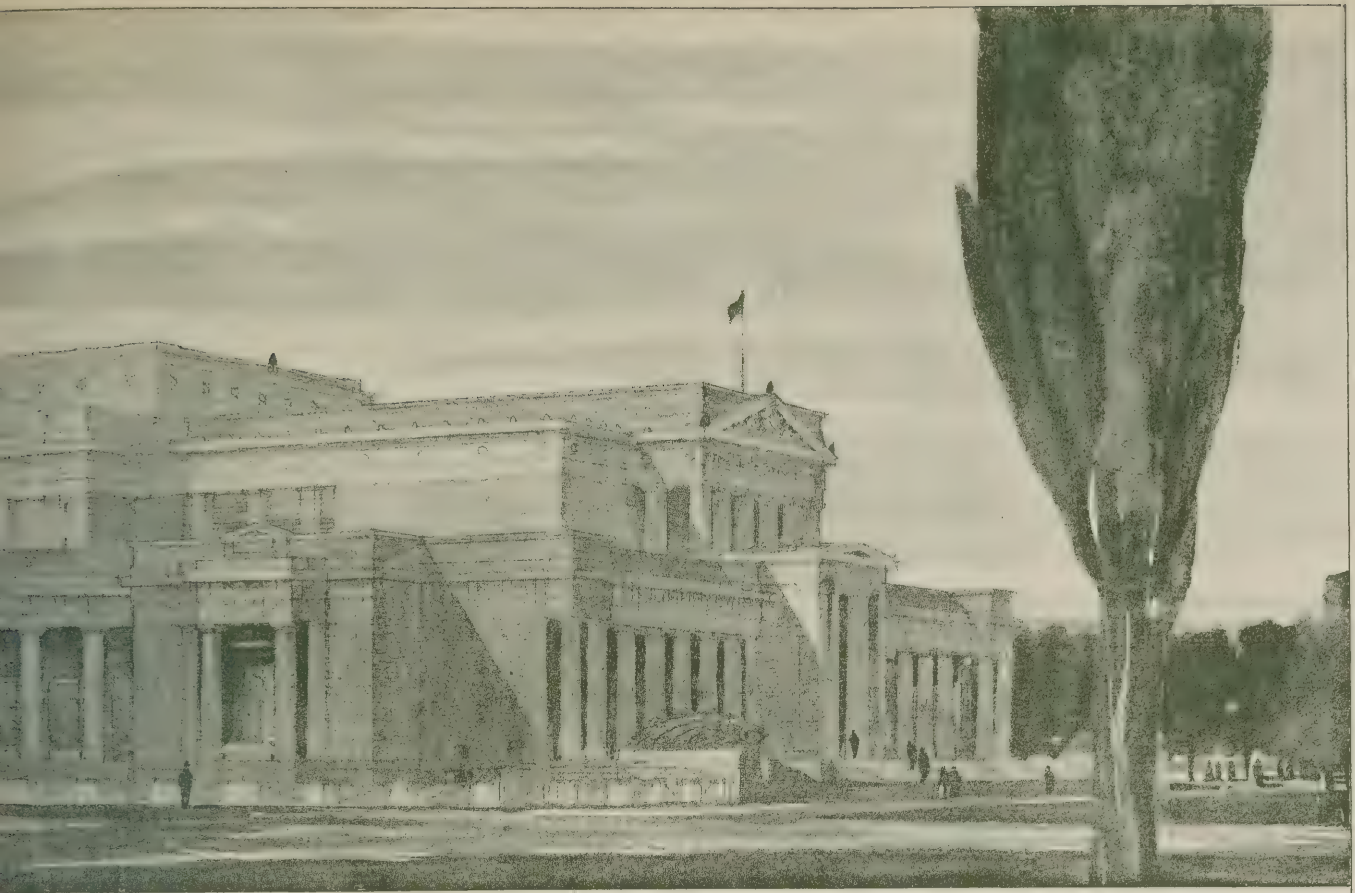

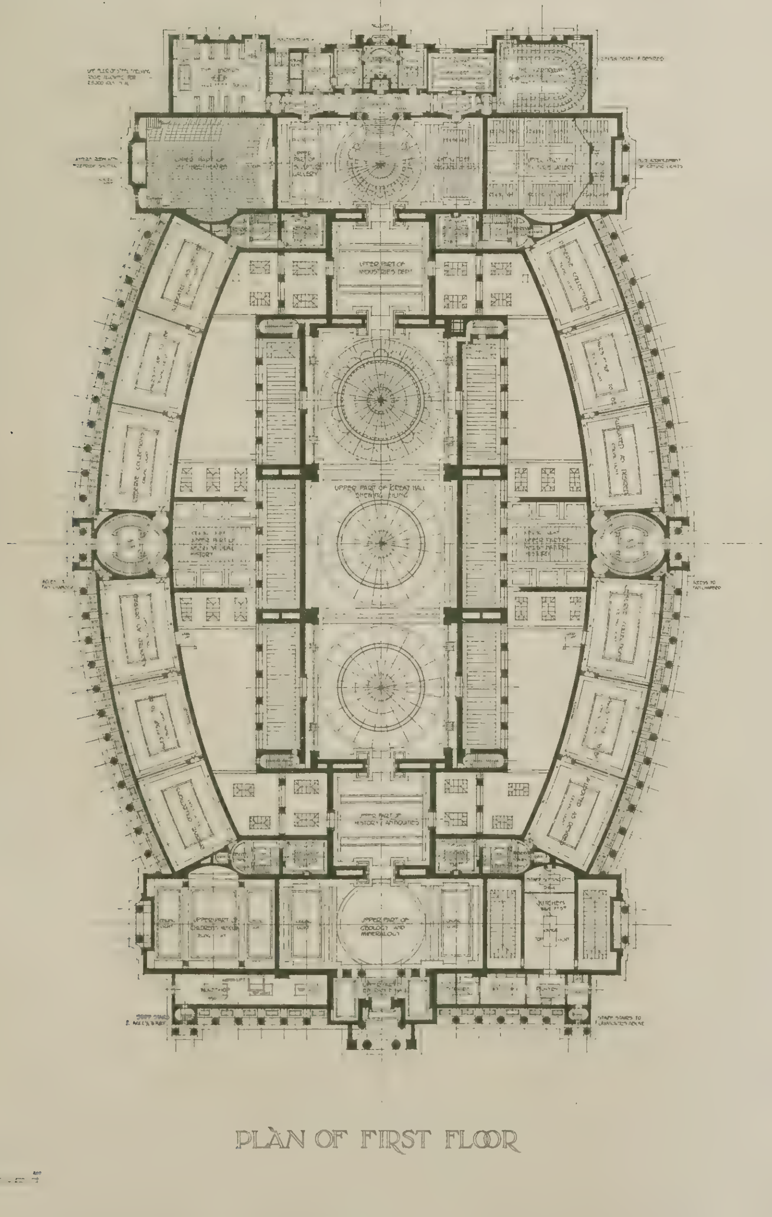
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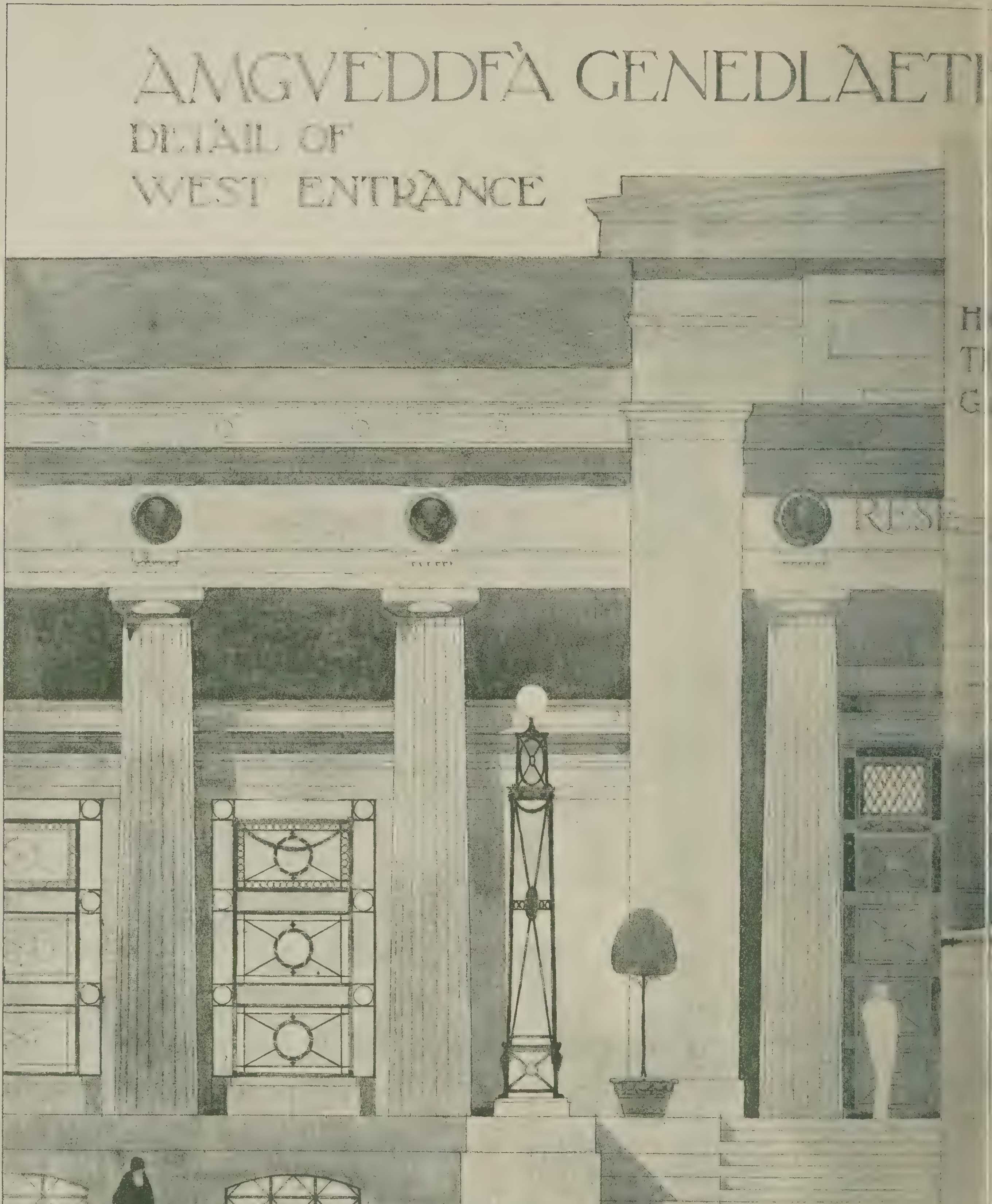

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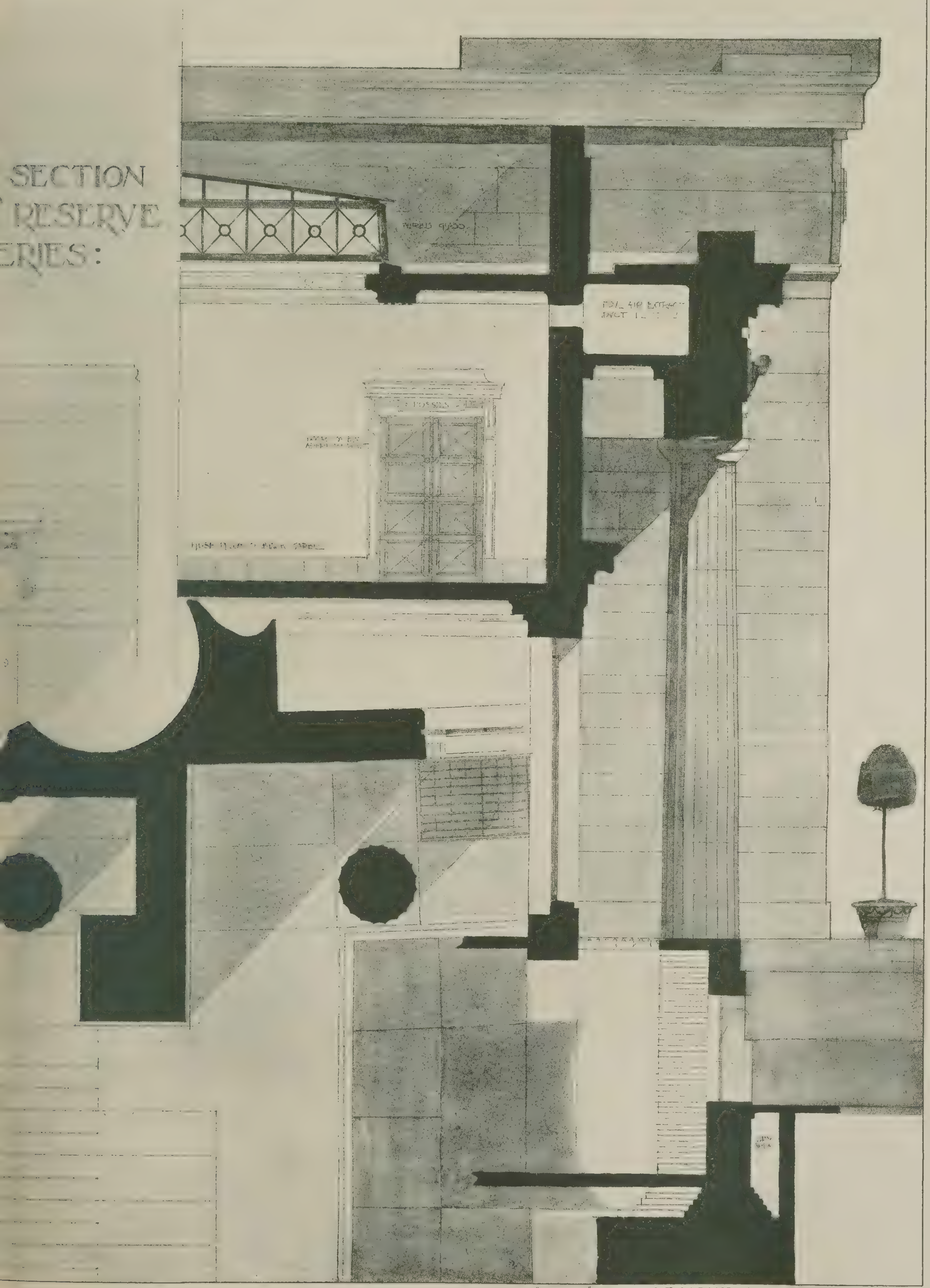

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The Architect.

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## FORTHCOMING EVENTS.

*Saturday, June 11.*

Royal Institution : Paper on "Electric Heating and Pyrometry" (Lecture 2), by Professor J. A. Fleming, M.A., D.Sc., F.R.S.

Edinburgh Architectural Association : A Joint Visit with the Glasgow Institute of Architects to Colinton, to be followed by a Dinner.

*Tuesday, June 14.*

The Institution of Gas Engineers : Annual Meeting (three days).

*Wednesday, June 15.*

Surveyors' Institution : Meeting of the Metropolitan Members to discuss the Finance Act 1909-10. Discussion to be opened by Mr. Howard Martin, Past-President.

Association of Municipal and County Engineers : Annual General Meeting at Plymouth (three days).

*Monday, June 20.*

Royal Institute of British Architects : Presentation of Royal Gold Medal.

## EXHIBITION OF WOODWORK AT CARPENTERS' HALL.

As a part of the good work which is being done in the cause of technical education by the ancient livery companies of London the occasional exhibitions of competitive work held at intervals by the Worshipful Companies of Carpenters and Joiners takes a high place.

The first exhibition of works in wood and wood carving inaugurated by these companies was held in the hall of the Carpenters' Company in 1884. There were then eighty-eight exhibits, and at each exhibition the number has increased until this year it is 327.

Cash prizes to the value of 288*l.* have been given by the Carpenters' Company, in addition to a number of gold and silver medals. The Joiners' Company, the Incorporated British Institute of Certificated Carpenters, and the Institute of Builders have also given numerous gold and silver medals. The generous and friendly support accorded to the work by other bodies is highly appreciated by the joint Companies. Particularly the Companies welcome the interest shown by the Incorporated British Institute of Certificated Carpenters, a body of considerable size and importance, which had its origin in the examinations in carpentry and joinery that have been held by the Carpenters' Company for many years past. This is the seventh exhibition of the series, and whilst it contains a greater number of exhibits than any previous one, the works are certainly of a higher standard and more interesting. The Carpenters' and Joiners' Companies, greatly concerned for the welfare of the craft which gave them birth in the fifteenth century, are anxious to preserve the craftsman as distinct from the machinist. In the present strenuous time of keen competition, when cheapness too often displaces worth, and when specialisation and machinery rob the workman of the opportunity of displaying originality, it is difficult to preserve the craft for the craftsman. An effort is being made in this direction by the joint Companies in the school at Great Titchfield Street, which is open to the trade only. An entire absence of machinery and a staff of skilled instructors give the workman an opportunity that he does not easily obtain elsewhere. Several of the prize-winners in this exhibition are passing, or have passed, through the classes of this school. All the exhibits are by British subjects, by whose hands the work has been framed and worked, except the one example in Division IV., to which this condition does not apply.

The programme of the competition, and consequently of the exhibition, embraced the following divisions:—I., Models in constructive carpentry; II., Models having the object of obtaining architectural and picturesque effect; III., Joinery; IV., "Trade" exhibits of specified character; V., Carving; VII., Carving by amateurs; VIII., a cabinet in hardwood. (Division VI. did not appear in the programme.)

Each division contained several classes, in which certain subjects were specified. Thus in Division I. the classes were:—(1) Ordinary roofs; (2) ornamental open timbered roof; (3) bridge centering, &c.; (4) framed centering for a concrete dome; (5) shoring, &c.; (6) a gantry and staging; (7) an elliptical dome. In Division II. the classes were:—(1) Uncovered stand of framed timber for 3,000 spectators; (2) a lych gate in oak. With regard to Divisions I. and II. the judges reported that the exhibits were of exceptional merit, and caused them some difficulty in awarding the prizes; the roofs in both classes showed a good knowledge of construction and careful workmanship; a very good model of a temporary bridge secured the first prize. There was one very good model for gantry and staging. The other exhibits in this class did not comply with the conditions. In Class 7 (elliptical domes) there were only two entries, one of which was excellent and showed knowledge and accuracy in setting out. Only one prize was awarded. There were numerous entries in the lych-gate class, which were distinctly good, and extra prizes were awarded. In the opinion of the judges the exhibitors generally showed a great desire to produce good work, and revealed an unsuspected wealth of sterling workmanship.

The exhibits in Division I. being almost entirely models to a scale of 1½-inch to a foot or less, there was, in our opinion, too great a tendency to employ planed hardwood, and we were pleased to note that the first prize in Class I. was awarded by the judges to Mr. H. F. Broadribb for a model of a king post trussed roof in which the model was true to nature by being in unplaned deal. In Class 2 another defect of the model was prevalent; curved members in hammer-beam and other open timbered roof trusses were cut out of one piece for roofs 50-feet span; consequently they were largely cross-grain and represented utterly impossible pieces of timber. The first prize model of a temporary road bridge over a river in Class 3, by Mr. John Colburn, was excellent both in design and execution. Practical merit was recognised in Class 4, in which Mr. Herbert E. Gibbs's model of framed centering for a concrete dome was rightly, in our opinion, awarded the first prize for clever economy of design, although other models were more elaborate. In Class 5, for shoring, the biggest model won, but it was also superior in idea. The first prize in Class 6 was awarded to a model by Mr. John Colburn for a gantry and staging for conveying a travelling steam crane in the

IN BRUGES.—From a Sketch by Mr. J. Grey West.

erection of a large railway station roof, which was a very excellent piece of work.

In Division II. there were only two competitors in Class I. for the grand stand, and the more practical and less elaborate model won. The lych-gate subject, Class 2, proved very attractive, and the best design won, being the work of Mr. George Jones.

In the joinery, Division III., the judges reported that they were gratified to find not only an increase in the number of exhibits, but also in the quality of the work.

In Class I. they unhesitatingly awarded the first prize to an apprentice, Mr. Albert E. Atkins, whose work, in spite of the merit of the others, was unquestionably the best.

A twin circular staircase by Mr. Herbert H. Durran was of such high quality that it was unanimously awarded a special gold medal given by the Joiners' Company for the best exhibit in Division III. A panelled and moulded niche in mahogany by Mr. Albert Daley ran it so close that through the generosity of the Builders' Institute that also secured a similar recognition.

We understand that Mr. Durran was a student at the Great Titchfield Street School, an evidence of the value of that institution for the training and improvement of craftsmen.

Many good models of doors were exhibited, but we were pleased to see that the prize in Class 5 for a front door in oak was won by a full-sized model, which was of good design as well as workmanship. In the high-class joinery class there was much very good work, and Mr. Albert Daley, who, as already noted, took a gold medal, won both the first and second prizes in the class.

Admirable as was the work exhibited in the divisions devoted to carpenters' and joiners' work, it was surpassed in both quantity and attractiveness—we will not say in excellence—by the wood carving, of which the judges said that the average of merit was remarkably high and, on the whole, above the last exhibition. They were very pleased to see so many apprentices enter in the various competitions, and also to see a great quantity of carving done with a view to the requirements of its special purpose rather than as an exercise in carving alone.

The judges congratulated the Carpenters' Company upon the great interest it has shown in encouraging the art of carving, adding that the Company are doing, in their admirable way, what should be done by the nation, and that it is a matter of great satisfaction that such a response has been made by the craftsmen to the efforts of the Company to promote a higher standard in design and craftsmanship.

Division VIII., in which a valuable prize of 20*l.* was offered for a cabinet in hardwood, attracted some very remarkable work, the winning exhibit, a cabinet in ebony and satinwood by Mr. J. H. W. Brandt, being an entirely satisfactory specimen of high-class British craftsmanship. The opinion of the judges was shown by the award of seven prizes in this division, which contained no more than eleven exhibits.

We consider that the Worshipful Companies of Carpenters and Joiners are to be congratulated on the excellence of their exhibition, which was indeed aided by some good loan exhibits, though these were scarcely necessary, as the high-class craftsmanship that the Companies have fostered is quite capable of maintaining a sufficiency of interest by itself alone.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

PARTLY, at least, owing to the near approach of the R.I.B.A. intermediate examination, very few students have contributed to the work of the Sketching and Measuring Club for May. The quality of the work submitted is, however, very high, and we have had some difficulty in awarding the prize to distinguish between drawings of almost equal merit.

"Sans Peur" has measured and drawn a stone screen in the north transept of Wells Cathedral, and has done so clearly and well; but the plan of the third order or smallest mullions should have been included with the others to show their joint relation. The design of the screen is not quite satisfactory in the way in which the tracery is cut off by the cornice, the second order of mullions butting up against the flat soffite in a very abrupt manner.

"Balgownie" has selected for his subject the upper part of the Tower of King's College Chapel, Old Aberdeen, with the crown surmounting it, carried on flying buttresses. This is a very difficult subject, and to show it completely would require much careful study and a large number of drawings. The author's work is, therefore, not sufficiently complete to reach the ideal of a perfect set of measured drawings, which should be such that if the building were suddenly to vanish into thin air it would be possible to reconstruct it from the drawings; but, as far as they go, "Balgownie's" drawings are satisfactory.

"Esek's" contribution this month is two sheets of measured drawings of the Tower to Guiseley Parish Church, Yorkshire. The subject appears to have been carefully measured, and many figured dimensions are included, but those shown are not quite sufficient for absolute certainty, while the character of the masonry is not clearly indicated by horizontal lines alone. "Esek" draws in rather too fine a line for Gothic work, and he has yet to learn the real shape of a bell.

Mr. Reginald Pywell has attempted an elaborate subject in the cloisters of Christ Church Cathedral, Oxford, of which he gives the complete plan, an elevation of one side, with sections and details of mouldings. The work is effectively and carefully done, and we have awarded the prize for May to Mr. Pywell for these drawings.

## NOTES AND COMMENTS.

Suggested memorials to King Edward VII. are naturally becoming numerous, and among those that commend themselves to us are the addition of a new chapel to Westminster Abbey, not by any means a novel idea, and a historical painting in the ambulatory of the Royal Exchange of some event in the late King's reign.

The India Society has been founded to promote the study and appreciation of Indian culture in its æsthetic aspects and to enlighten the present ignorance of European artists and students concerning the vast unexplored field of Indian sculpture, architecture, and painting, as well as of Indian literature and music. The Society proposes to publish works showing the best examples of Indian architecture, sculpture, and painting, both ancient and modern, which will be issued free, or at low prices, to members of the Society. The British rule in India has been for the most part concerned with the political and social conditions of the country, and its art has very largely been neglected, at any rate comparatively, despite the inclusion in our museums of some specimens. Therefore such a Society as is now founded may be welcomed as only a part of the duty which our presence as rulers in India involves upon us. The subscription to the Society is one guinea per annum, and the Hon. Secretary is Mr. T. W. Rolleston, of Ardeevin, Christ Church Road, Hampstead.

We regret to have to announce the death of Mr. Matthew Henry Holding, A.R.I.B.A., who for the last thirty years has been prominent as the leading ecclesiastical architect in the county of Northampton. Among some of Mr. Holding's works were the churches in Northampton of St. Crispin, St. Mary, Far Cotton; St. Paul, St. Matthew, Christ Church, and Holy Trinity, and the restorations of St. James and St. Giles. Much restoration work also was carried out under Mr. Holding, both in the county of Northampton and further afield.

In the King's Bench Division of the High Court Mr. Justice Coleridge gave a very important decision in the case of Mudd *v.* General Union of Operative Carpenters and Joiners, to the effect that the Union was an illegal society because some of the rules contemplated such a restraint of trade as to make all the other rules unenforceable, and these were the main feature of the rules in general. The plaintiff was suing the Union, and obtained a verdict from a jury for 5*l.* for the loss of his tools in a fire. Thus, by reason of the Union being an illegal society, the plaintiff, on the point of law, could not enforce his claim for any benefits to which the rules of the Union would apparently entitle him. Thus members of trades unions in general have no legal claim for benefits, which we may suppose are among the inducements for men to join, if the rules of the Union illegally act in restraint of trade, as probably the rules of every trades union do.

The Lord Mayor and other members of the City Council of Birmingham have made a tour on the Continent to study town planning in Berlin, Vienna, Munich, Ulm, Mannheim, Frankfort and Düsseldorf, and have apparently learnt much that will be to the advantage of the city of Birmingham when the provisions of the Housing and Town Planning, &c., Act. 1909, come to be applied in their district. It is well that the members of governing bodies should take such steps to educate themselves rather than that they should rely on their expert advisers for everything. For so far the experts are only learning, and, as far as we can see, are apt to seize on one aspect of the subject and ignore others. Hence the value of intelligent criticism by their employers, more especially as members of local governing bodies are apt to indulge in unintelligent criticism and opposition in default of ability or knowledge to offer better.

A very interesting old house in Friar Street, Worcester, is now in the hand of the repairers, and is being made ready for use as a restaurant. It is fortunate that this house has fallen into safer hands than those that have demolished many of the most interesting houses in the city, which constituted part of the architectural history of England. This house in Friar Street is built in the old Worcestershire style, namely, of oak timber and wattle and daub, but this had been covered by lath and plaster, and it was only when the walls were being cleansed that the interesting archæological features were brought to light. The structure has been very much pulled about, and what was once one commodious house has been turned into five tenements. Perhaps the most important feature is an old fireplace, with a seat in the chimney corner, somewhat smaller than that at the Old Trinity House. One side of the fireplace and the stonework are well preserved; but the left side has been partly destroyed, and is restored in modern brickwork. The date of the feature cannot yet be fixed, but it is certainly probably several hundred years old. The deeds of the house go back to James I. In another room has been discovered a very good plaster ceiling, on which are to be seen the Royal Arms. The arms include the lion, unicorn, Tudor rose and pomegranate, the last-named being very largely used in Prince Arthur's chantry in Worcester Cathedral. It came with Prince Arthur's marriage to Katharine of Aragon, but apart from the fact that the ceiling is of a Tudor period no exact date can be given.

The Bishop of Birmingham has, at St. Luke's Church, Cherrywood Road, Saltley, dedicated a rood screen which has been made and erected by members of the congregation. The figures of Christ crucified and of Mary and John appear in the centre of the screen over the chancel. The Bishop, in an address in which he referred to the erection of church screens in mediæval times, said he was glad to be able to dedicate a screen and rood which the congregation had themselves made and offered to God. The English people had, he said, been particularly fond of these rood screens and roods. There was a time in the fourteenth and fifteenth centuries when the English nation was much more full of artistic skill than it was at present, and it came about that in almost every parish throughout England where already a church of beauty and dignity had been erected the people furnished it with a screen of woodwork so beautiful that the remains of their skill excited the admiration of all who went to look at them. This England of ours must then have been a wonderful land so far as its churches were concerned. There was, at any rate, no doubt that in every parish there was a great deal of artistic skill which was exercised in the production of these screens.

## EXHIBITION OF THE WORSHIPFUL COMPANY OF FOUNDERS.

THE Worshipful Company of Founders is one of those in the City of London that recognises that the craft it represents should receive whatever encouragement the Company can give in the direction of improvement in the craft, in other words, the extension of technical education. With the assistance of the Worshipful Company of Ironmongers, whose interests in craftsmanship are naturally closely allied, the Founders' Company has organised a competitive exhibition for specimens of the founder's craft. The sum of 187*l*. 10*s*. has been offered in cash prizes, besides numerous medals and certificates.

The scope of the exhibition may be best gathered from the resolution of the Court of the Company that "The Master, Wardens, and Court of Assistants of the Worshipful Company of Founders do hold an exhibition of castings and models in metals—viz. aluminium, bronze, brass, gold, iron, and silver, all to be cast from the crucible; also designs in wood, plaster, or any suitable material for casting from, and they would offer the prizes set out on the following pages, to be competed for by founders, designers, craftsmen, apprentices, and improvers, British born, engaged in foundry business or allied trades, and residing in England."

We regret that only sixty-nine competitive exhibits make up the response to the invitation of the Company, but it must be remembered that in the present day there are few actual craftsmen founders who are not simply paid servants of a commercial firm or limited company. The founder, in fact, is now scarcely, in the true meaning of the word, a craftsman, but a skilled artisan who cannot determine what he shall cast or how he shall do it, but has to do what he is told to fulfil his master's contract with some customer of whom he knows nothing.

In foundry work there are two distinct divisions—the making of the model or pattern and the casting. It is but seldom now that a craftsman is in a position to unite both, and he cannot therefore be considered a complete and true craftsman under such conditions.

The principal prize was for the best model of a medal for the Founders' Company, obverse, coat of arms of the Company; and a design for the reverse, 12 inches in diameter. This has been won by the reverse of A. Stanley Young, which is a fine piece of composition representing a master founder and his apprentice or journeyman in the act of casting. The modelling is excellent, and the relief just what it should be for a medal. The second prize design by Agnes Keshaw Halliday also obtains its position for the reverse, although this is not equal to that of the first prize-winner in the treatment of the subject, which is lacking in decorative feeling and is in too high relief. In neither of the two prize designs is the heraldry of the obverse quite satisfactory, and it is far inferior to that of Edmund Ware, who has given quite the best rendering of the Company's arms, but whose reverse is tame, commonplace, and unimaginative, although well modelled.

The prize for the best casting has been won by a "Goat modelled from Life" by Arthur Huskinson, which is a fine work both in modelling and in casting. For the best group, or figure, or head, the first prize has been awarded to a bust of Sydney R. Pollard, Esq., Master of the Founders' Company, by Mortimer Brown. We had no difficulty in recognising the Master from the bust, although in the latter we think the geniality of character of the original is not sufficiently expressed.

The second prize, won by a "Bronze Figure of Inniskilling Dragoon (1815)," by J. A. Jackson; and the third prize for "A Reaper," by Samuel W. White, have both been obtained by work admirable in pose, in modelling, and in casting.

For the best panel in ornament or figure the first place has been obtained by an "Ornamental Panel for Grate-back," by H. E. Warren, a magnificent piece of heraldry. We prefer the work of the winner of the third prize in this class, Thomas Benton, to that of F. W. Braddock, whose "Monk Writing at a Desk" is placed second, and is, to our thinking, in too high relief. A very good piece of low relief is "Helias descending into the Sea," by A. Stanley Young, which is awarded a certificate.

The prize for the best bell has been given to a "Model of a Church Bell, loam cast," by A. F. Sysachman, which is good in design and cleanly and sharply cast. There are only three competitors in this class, and each receives a prize, so that it follows that all are meritorious.

Three designs compete for the prize for a cast railing, and the first prize has been awarded to J. W. Wilkinson for a railing for a pier, which cleverly is made up of dolphins and seaweed conventionalised, and is a successful production. The first prize for the best design for any kind of cast metal-work is shared between Miss Dora Bard and G. Edwards Tucker, the former submitting a rain-water head and the latter a gold cup representing "Life and Music." Neither are entirely satisfactory.

The exhibition has been made more attractive by a loan collection contributed by Sydney R. Pollard, Esq., the Master of the Company; John Place, Esq., Messrs. S. B. Goslin & Son, Messrs. James Dixon & Son, Messrs. Elkington & Co., Ltd., and Messrs. H. Young & Co., Ltd., which served to adequately fill the rooms in the hall of the Ironmongers' Company in which the exhibition was held.

## EXCAVATIONS AT TORTINGTON PRIORY, SUSSEX.

A MEETING of the Royal Archæological Institute was held on Wednesday, June 1, at 20 Hanover Square, W., when notes were read by Mr. P. M. Johnston, F.S.A., F.R.I.B.A., on the excavations which he is superintending at Tortington Priory, in Sussex.

Tortington, he said, is one of those small parishes with a small population and a small church to match, so common in Western Sussex, near the sea. Though only three-quarters of a mile from Arundel, with the living of which it is now united, its proximity does not seem ever to have affected the number of its inhabitants. The parish church now stands quite alone, with the exception of a farmhouse near by. It is not mentioned in "Domesday" (1086), and it is uncertain that any then existed. For this reason it is possible that it was the child of Tortington Priory—*i.e.* it may have been built by the monks to supply the wants of their tenants. This would give the tiny structure an interest of its own, as, unlike all the neighbouring village churches, it has not replaced a more ancient building and preserved an older plan or incorporated in its structure earlier features.

The priory was founded for a small establishment—never more than seven or eight—of canons of the Order of St. Augustine, commonly known as Austin Canons or Black Canons, at some date in the twelfth century. A good deal of uncertainty exists as to who were the founders of the priory, and at what date it was established. Upon the answer depends the truth or otherwise of the assertion that the parish church was built by the canons of Tortington for their tenants and dependents, a statement which, though probable enough, at present lacks both documentary and architectural evidence.

According to Dallaway the foundress was Alicia Corbet, who is supposed to be a member of the D'Albini family. Dugdale gives the name more correctly as Hadwissia (the same as the German *Hedwig*) Corbet. Popular report of her is that she was a mistress of Henry I., but there is no documentary evidence of this. All the architectural evidence goes to show that the priory church was a good deal later than it would have been if there was any truth in this legend; 1180 is the earliest date for any architectural features. There was found a good deal of hatched work of Middle Norman date. Very large parts of the excavations have been abandoned.

The dedication of the priory was in honour of St. Mary Magdalen, and the parish church seems to have been placed under the same saint. The late Mr. Charles Gibbon (Richmond Herald), in a paper upon the dedications of churches and chapels in this part of Sussex, wrote "Unknown as yet" against Tortington, and in the "Chichester Diocese Clergy Lists" there is no saint appended to the name. However, in the "Feet of Fines for the County of Sussex" there is an entry relating to an arrangement come to in 1214 between William, Earl of Arundel, and Pharamus de Tracy in which "the advowson of the Church of St. Mary Magdalen of Tortington" is mentioned. If this can be taken as referring to the parish church it would show that the priory and the parish church were placed under the same patron saint.

For the last century and more of its history, until in 1536 the priory was surrendered to Henry VIII., its record is one of decay, neglect, and disorder. There were at the date of its suppression five priests and one novice. The revenues of the priory were mainly derived from lands in West Sussex. Among the advowsons it possessed was that of St. Swithin, in London, where the prior had a house in which he occasionally resided. This was the gift of Robert Aguillon, North Stoke, when he bequeathed his body to the canons to be buried in the priory church. The architecture of the building must have influenced that of the little church of the parish. To what extent this was so it is difficult to judge owing to the scanty remains of the priory church and buildings. At present all that exists above ground are parts of the north transept and north wall of the nave of the priory church, with some graceful vaulting shafts, which indicate a date about the middle of the thirteenth century. Built up in some comparatively modern walls of the farm buildings now occupying the site are numerous fragments of columns and sections of mouldings belonging to more than one date in the twelfth and thirteenth centuries. It is probable that the adjacent barn was built of the old materials.

When the buildings were surrendered to Henry VIII. in 1538 the site of the priory was granted to Henry Lord Maltravers. In Elizabeth's reign the estate came into possession of Roger Gratwick, of The Ham, Angmering. He built the old manor house called Tortington Place largely with the materials of the priory, for, as far as one can conjecture, he seems to have pulled down the greater part of the buildings immediately and to have commenced the erection of a house. These Gratwicks, however, seem to have exercised a generally protective influence over churches. The estate passed through the female line to the family of Weekes, one of whom represented Arundel in Parliament in 1702, and this gentleman sold it to William Leeves in 1706, from whose descendants it was purchased by Charles, Duke of Norfolk.

Mr. Johnston expressed his warm gratitude to the present Duke of Norfolk for the trouble he had taken and the monetary assistance he had given towards carrying out the excavations. Thanks to his help, no difficulties had been encountered.

The work of demolition was carried out very thoroughly at the time of the Dissolution. The most interesting finds were three leaden coffins with richly ornamented lids dating between 1180 and 1200. One of these has been sent to the British Museum. There seems to be no question that the priory church had a central tower. Close by are the remains of a large building which was probably the refectory and near to it more remains which were presumably a kitchen. Among the latter was a well-made shoot filled with oyster and snail shells, tiles, and remains of stained glass.

## RENAISSANCE MONUMENTS IN THE ROMAN CHURCHES, AND THEIR AUTHORS.*

RENAISSANCE sculpture in Rome has, naturally, been overshadowed by the Antique. And yet the monuments which fill her churches, or have been broken up and hidden in crypt and cloister, display a remarkable, and, in a sense, unique development of fifteenth century art and portraiture.

Here you may follow, sometimes in one single church, the whole evolution of monumental art, from the earliest times, when it began to be an object to those who were leaving an uncertain and unquiet world, to secure a last resting place in the immediate neighbourhood of the shrine, where the relics of the saint and the presence of the miraculous elements offered the surest guarantee against disturbance. But it was only for the great and influential that room was found within the sacred edifice. Their effigies were set recumbent, inlaid in the pavement, humbly near to mother earth, the bishop clasping his crozier, the warrior of the church his cross-hilted sword, and soon the feet or knees of thronging worshippers wore away their marble outlines and even the record of their names. Then some of the more illustrious were elevated on a base, secure above the tramping feet, as on a pier set against the wall. As time went on, a niche was hollowed out to receive the tomb; the vault became a canopy, and the effigy lay as it were on a bed, from which angels, rudely carved, drew back a curtain to reveal the face of the sleeper. So the wall-grave arose, and the living fought with tooth and claw to secure the option of the choicest spot wherein to lie through future centuries. The delicate art of the Cosmati redeemed by exquisite colour and design the incompleteness of the sculptor's craft, and gradually, with the spirit of the Classical revival, the Gothic and Romanesque character of the wall-graves gave place to the more accomplished and conscious manner of the Renaissance. Rome, which has always rather tended to assimilate than to produce, summoned the skilled craftsmen of Tuscany and Lombardy to assist in preparing for the princes of the church memorials appropriate to the stateliness and magnificence of their lives. In the latter half of the fifteenth century the revived art of sculpture was touching the plenitude of achievement, and for a brief moment in the finest examples of the Roman ecclesiastical monuments, we are dimly reminded of the restraint and dignity with which the Attic Stelæ treated the presentation of death. The great prelates of the Renaissance are portrayed to us, robed and mitred, lying in tranquil sleep on the flowered sarcophagus. The saints of their choice occupy shell-vaulted niches in the pilasters which support the architrave above them, and from the lunette the Madonna looks benignly down on one who should have been her faithful servant. If the modern spirit had already invaded their lives, if rationalism and materialism were in reality fast undermining the significance of forms and ceremonies from which they turned to Pagan intellectualism, fifteenth-century art at any rate preserved for a little longer the tradition of a less complex psychology. But as the struggle for mastery over material execution ceased to be apparent, the vanities of the world invaded even the monopolies of death. Not willingly did the great and powerful resign the state that had meant so much to them, and even in death they were reluctant to be dissociated from a part in life. The recumbent figure on the sarcophagus draws up one knee, raises the head, and, propped on one elbow, the departed prelate watches the movement of life below, or enviously regards the more sumptuous sepulchre of his rival. So Sansovino interpreted the new spirit of the age. Before long the tenant of the costly monument is sitting bolt upright, and the suggestion of death is conveyed by a skeleton deftly carved in yellow marble relieving against the background of basalt. From the baroc piles in St. Peter's the enthroned pontiffs of the seventeenth and eighteenth centuries continue, as in life, to dispense benediction or menace heresy, and, following the descending curve of degeneration, we reach the nadir of art in the modern horrors of the Campo Santo.

I propose to deal briefly with the second half of the fifteenth century, and attempt to establish a few attributions of authorship, to clear away a few misconceptions, due in many cases to the confused statements of the indispensable but uncritical Vasari, and to introduce to your notice certain craftsmen little known to the general public, whose contribution to the achievements of Renaissance art has emerged from the researches of Müntz and Bertolotti, and the critical investigations of Guoli, Venturi, Tschudi, Schmarzow, Fabriczy, and others.

The great Donatello visited Rome in 1433, and executed a sepulchral slab for the tomb of the Archidiacono Crivelli in the Church of Aracœli, as well as a marble tabernacle, once in Sta. Maria delle Febbre, and now preserved in the Sacristy of St. Peter's, which is historically important, as being the first work of a monumental character in which he finally discarded all trace of the Gothic tradition. While here, he no doubt came across an old associate whom he had known at Pisa, who was now engaged on various works in the Vatican, one Pippo, or Filippo di Gante, a Pisan sculptor, whose father had exercised the same craft before him, and whose son, Isaiah of Pisa, brought up it would seem in the eternal city, may be regarded, in conjunction with his constant associate, Paolo Romano, as the founder of the Roman Renaissance school. Isaiah's son, Gian Cristofero Romano, well known for his work in the Certosa of Pavia, became its most skilful exponent in the early years of the sixteenth century. We have thus four generations of craftsmen in the same family. The principal works of Isaiah are recorded in a contemporary Latin panegyric poem by one Porcellio de' Pandini, preserved at Pisa, and others we are able to identify by his well-marked archaic style, formed it would seem by the study of late Roman classical models, or again by the entries of payments in the pontifical accounts during the reign of Pius II., where he is found constantly working with the favourite artist of that pope, Paolo di Mariani di Tacco, better known as Paolo Romano. Time will not allow me to investigate in detail the work of these two masters, or the parts they took in the most considerable monument of the time, the triumphal arch of Alfonso of Aragon, at Naples, but one or two points I must ask you to hold in mind in view of their bearing on the subsequent evolution of sculpture in Rome.

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* A paper by the Right Hon. Sir Rennell Rodd, G.C.V.O., K.C.M.G., P.C., His Majesty's Ambassador to the Court of Italy, read before the Royal Institution of Great Britain on June 3.

In the first place it seems to have been Isaiah of Pisa who set and fixed the type in Rome generally adopted for the sepulchral monuments of the Renaissance. At any rate the first complete example we have is from his hand, in the tomb of Pope Eugene IV., who died in 1447. It was executed during the reign of his successor, which extended to 1455. Removed from St. Peter's to San Salvatore in Lauro, probably in the reign of Paul II., it may have suffered in transport, as certain portions, the two figures in the niches on the left side and the kneeling angels in the recess, are the work of another and apparently somewhat later artist employed to reproduce the broken pieces. The monument was evidently similar in design to another tomb of Isaiah's, namely, that of Saint Monica in the church of S. Agostino, which was broken up when the church was modernised. Only the recumbent figure and the plain sarcophagus remain *in situ*. The four saints from the pilaster niches, much mutilated, are now set up in the porch of the transept entrance, and they are identical in design with the figures on the tomb of Eugene IV. Another monument by Isaiah, slightly earlier in date perhaps than either of these, that of the Portuguese Cardinal Chiaves, might be reconstructed from the pieces scattered over the Church of St. John Lateran. The type of Isaiah's monuments is rather Tuscan in character, modified perhaps by a study of the Roman triumphal arch. The latest record we possess of his activity is an entry in the pontifical accounts, in the year 1464, when he received payment for work done in conjunction with Paulo Romano on the tabernacle made to contain the head of Saint Andrew, a priceless relic brought to Italy from Greece by Thomas Palaeologos, despot of Morea. The remains of this tabernacle are now in the crypt of Saint Peter's, and a comparison of the pieces from two lunettes is interesting as showing the difference between the work of Isaiah and Paulo.

I must content myself with but a brief reference to that interesting personality in the history of Roman sculpture, Paolo di Mariani, known as Paulus de Urbe, or Paolo Romano, who is not to be confounded with another earlier Magister Paolo, the author of several monuments erected at the beginning of the fifteenth century. He will, however, serve to introduce to you another name, which presents a very curious problem.

Vasari knew but little of either Isaiah or Paolo Romano. He assigns to the Florentines, Niccola and Varrone, the tabernacle of St. Andrew, and to the latter the statue of St. Andrew, near the Ponte Molle, erected on the spot where the relic was received. But the evidence of the pontifical accounts is conclusive, and they show that Paolo Romano was paid 33 ducats for its execution. In his short biography, however, Vasari tells a curious story of a rivalry which sprang up between Paolo and a certain Mino del Reame, or del Regno, which means, of course, the kingdom of Naples. This Mino, whose name, he says, was perhaps Dino, challenged the Roman sculptor to compete with him for the execution of a colossal statue of St. Paul, and adds that Paolo was so harassed by the persecutions of this Mino that he renounced his intention of carrying out a colossal statue of St. Peter, which had been ordered from him by Pope Pius II. Now the curious thing is that the Vatican accounts contain records of payments for pedestals for the statues of St. Peter and St. Paul, ordered of Paolo Romano, which were to be placed at the foot of the steps leading to the old Basilica, as well as for a statue of St. Paul, while there is no entry of payment for a statue of St. Peter. On the other hand, the two statues which originally decorated the approach to the church actually exist in the sacristy of the present St. Peter's, and both of them would seem to be from the same workshop, and resemble the other work of the Roman sculptor. Again, there is another statue of St. Paul, stated by Vasari to be by Paolo Romano, which now stands on the bridge of St. Angelo. The idea of two sculptors making statues 14 or 15 feet high, merely in a spirit of rivalry, is rather extravagant, but there is probably, as usual, some truth behind Vasari's story, and curiously enough we find over the door of the church of St. Giacomo in Piazza Navona two angels by different hands supporting an obliterated shield. Under one of them is carved in large letters "Opus Paoli," and under the other "Opus Mini." The latter, which is much the better and freer of the two, is, in my opinion, not the work of Mino da Fiesole. There are other references in Vasari, too circumstantial to be ignored, to this second Mino, and I think there is justification for the re-establishment of a personality new to general experience, and for a differentiation of his work from that of the better
known Mino of Fiesole, who has hitherto been credited w
it.

Mino de Fiesole no doubt did important work in Ro
and exercised influence over other sculptors there. To ap
ciate what he really did, the chronology of his visits is
portant. Leaving untouched the question of whether or
he was the author of the Strozzi bust in the Berlin Muse
with an inscription recording that it was made by him
Rome in 1454, when he can only have been twenty-one
twenty-two, we know from the Vatican registers that
was there in 1463, when he was employed, together w
Isaiah and Paolo, on sculptures for a pulpit which Pius
designed to place outside the Basilica of St. Peter's, f
which to give the benediction. This pulpit was ne
finished, but the statues of the Apostles made for it may
seen in the crypt of St. Peter's. To this period no do
belong some panels made for a casket to contain relics
St. Jerome ordered by Cardinal d'Estouteville for Sta. Ma
Maggiore, which church his eminence was restoring at
own cost. They may be seen to-day in the Industr
Museum at Rome, and are of extremely poor workmansh
though unmistakably revealing Mino's characteristic st
In the Vatican registers no mention of him is tracea
during the reign of Paul II., 1467-71, and we can acco
for his presence elsewhere from 1469-73. He was apparen
recalled to Rome in or about 1474, in the reign of Sixtus I
to carry out the monument of his predecessor. In 1480
was back in Florence, and in 1484 he died.

The manner of Mino da Fiesole is well known to all
have studied Italian art; the fine and delicate folds of
draperies, his constant use of sharp angles, with a prevail
suggestion of the diamond shape, which even seems to
vade faces and individual features; the thick eyelid and h
closed eye; the sharp knee, protruding through the d
phanous dress fabric; the regular fall in rather conventio
repeating angles of draperies between the open knees of
seated figures; the flat treatment of hair, consistent with
general shadowless scheme, free from all deep cutting;
weak and rather meaningless pose of the hands; the secu
and aristocratic type of his Madonnas, as opposed to
devotional type; all these, together with a certain precio
ness and an artist's love of his material, which make h
give the marble an ivory-like polish, and in his later w
an elaboration of delicate ornament and tracery.

During his second visit to Rome after 1474 we must rat
regard him as having been the guiding spirit of a great wo
shop from which issued a number of the finest monuments
the period. No single one is entirely from his hand, unl
it be the tomb of Francesco Tuornaboni, in the Mine
Church, which was probably carried out in Florence. Th
extensive commissions were probably divided up among
members of an artistic partnership, each undertaking
portion for which he had a special reputation or aptitu
In some cases the only contribution of Mino seems to h
been the Madonna of the central niche or lunette.

And first, as regards the more important work in Ro
which has been wrongly, I venture to think, attributed
him. In the Church of Sta. Maria Maggiore are the c
ponent parts of a magnificent ciborium, made for Cardi
d'Estouteville, whose portrait appears on one of the panels
donor. The four large panels are now set up in the apse
the church, and a large number of smaller fragments are
the sacristy, including a relief of the Madonna and Chi
inscribed "Opus Mini," one very similar to which, but
signed, is in the collection of Count Strogonoff, of Ro
As the restoration of the church, of which this cibori
was the principal ornament, was completed by 1474, it see
probable that the altar itself was also anterior to the ret
of Mino da Fiesole to Rome, and were it admittedly his,
could not be contemporary with the very inferior work
the panels illustrating the life of St. Jerome. While cert
pieces have features which resemble the style of the Fiesol
especially in the poise of the figures, which rest on one
only, I have, after a careful study of the whole, come
the conclusion that it is not his work, but that of a c
temporary, whose manner presents analogies and affinit
but also marked differences. The Fiesolan was not a s
cessful craftsman in relief: witness his feeble contributi
to the pulpit at Prato. The panels of this ciborium
finely and boldly conceived. The scene of the Nativity i
charming and felicitous composition. But the type of
Madonna in the Adoration of the Magi, as well as in
Assumption, is quite unlike the type of the Tuscan. S
more may this be said of the Virgin on the panel in
sacristy and its fellow in Count Strogonoff's collection, wh
are essentially devotional in character, and I, at any ra
know of no example by Mino da Fiesole the least resembl

them. The flying angels in the *mandorla* round the Virgin of the Assumption appear to be by the same artist who competed with Paolo Romano for the angel over the door of the Church of St. Giacomo. A tabernacle for holy oil in the Church of Sta. Maria in Trastevere, also inscribed "Opus Mini," appears to be by the same sculptor, as well as a Crucifixion in Sta. Balbina, which is strongly reminiscent in execution of the fragments in Sta. Maria Maggiore. On the other hand, the master of Fiesole does not seem to have blazoned his name on the marbles in Rome which are undoubtedly his. On one of these only have I found a signature, and there it is quite difficult to find, modestly hidden in a top corner. Under these circumstances I was not surprised to find that Professor Venturi, in the new volume of his monumental work on the history of Italian art, boldly assigns the sculptures of Sta. Maria Maggiore to Mino del Reame, an artist who had studied the Tuscan Mino, and was a rival of sufficient importance to be styled the Mino of Naples, and to sign that name on his own work without any compunction as to infringement of copyright.

In considering Mino da Fiesole's own work in Rome, I will first ask you to accompany me to the crypt of St. Peter's to inspect the fragments of the tomb of Paul II., of Pietro Barbo, the Venetian Mæcenas of art, the builder of the Palazzo Venezia, and the greatest collector of his time. It was erected by his nephew, Marco Barbo, immediately after his death, removed when the old Basilica was pulled down, re-erected in the new St. Peter's in the middle of the sixteenth century, and subsequently once more broken up and relegated in fragments to the crypt to make room for other sepulchres more appropriate to the baroc splendour of the new edifice. Its original design was somewhat different, as we learn from a rough sketch in a manuscript now in Berlin. The panels at the side are an addition, as well as the corner pieces squaring the lunette. Over the centre of the lunette there was originally a relief representing the Father in a glory of cherubim, and on either side winged angels, set like crockets, on the arch. Even a superficial examination of the component parts shows that the sculptures are by two different hands. The lower base, in two pieces, is now in the Louvre. Vasari says Mino del Reame worked on some small figures in the base, and these putti between the floral festoons have analogies with some of the ornamentation of the ciborium in Sta. Maria Maggiore. By Mino da Fiesole are the allegorical figures of Faith and Charity in the base, the latter among the finest examples of his art, and signed at the top right-hand corner unostentatiously; the Temptation, now stripped of its two principal ornaments, which were originally mortised on, and were probably objected to by the same spirit which imposed the addition of breeches to the nude figures in Michel Angelo's "Last Judgment"; the evangelists Luke and John, of the pilaster niches, and the relief of the "Last Judgment" in the lunette, as well as half the angels on the rim, now scattered about the crypt with their fellows, designed by his associate in the execution of the monument. The rest of the sculptured pieces are evidently all designed by the same artist, and though his personality and style are very individual and quite unmistakable, his name might have remained a mystery had he not recorded it in large letters under the feet of the figure of Hope: Giovanni Dalmata—John the Dalmatian. So far as I am aware, this inscription is the only record of his name in Rome, and no written document has yet been found which testifies to his presence there. But with the evidence of style afforded by the monument of Paul II. we are able to identify a considerable amount of work by this artist in Rome. The panel in the base displaying the creation of Eve is also his—a remarkable composition, minutely and scrupulously finished—as well as the evangelists Matthew and Mark, the large panel above the recumbent figure, representing the Resurrection, and the relief of the Almighty in benediction, which once surmounted the lunette. Dalmata also executed the recumbent figure of the Pope—a remarkable piece of portraiture—and a very graceful design for the panel roofing the square niche in which it lies.

This interesting sculptor, who, like Laurana, Georgio da Sebenico and others, hailed from the further side of the Adriatic, is little known in this country. For contrast's sake compare Mino's figure of Charity, typical of his well-known manner, with this Dalmata's figure of Hope. The most obvious differentiation lies in the mode of treating draperies. The stuff falls in heavy round folds and rock-like masses. There is a realism of execution suggesting direct study from the model which contrasts with the artificial precision of Mino's method. His angels and female faces have a cast of countenance foreign to Italian art, and perhaps recall the types of his country of origin. For the masculine faces, look at the creation of Eve and the Resurrection. In all these faces you will notice a characteristic not very pleasing, a certain obtuse and inert expression. Once appreciated it is unmistakable, and gives a clue to nearly all Dalmata's work in Rome. Another monument, executed about 1479, that of Cardinal Eruli, the fragments of which are also in the crypt, seems to have been entirely Dalmata's.

We have another example of co-operation between Mino and Dalmata in the fragments of a ciborium altar, also executed for Marco Barbo, and set up in the church of St. Marco in 1476, which have now been put together, with barbarous disregard for its original design, in the sacristy of that church. The reliefs, however, belonged, there is little doubt, to the tabernacle which is inserted between them, as their subjects are typical of the holy elements to be reserved there. That on the left, representing Jacob bringing savoury meat to the blind Isaac, is Dalmata's; that on the right, by Mino, represents Melchisedec giving bread and wine to Abraham.

(*To be continued.*)

## ALL SOULS COLLEGE, OXFORD.

By C. Grant Robertson, M.A.

(*Concluded from last week.*)

Of the other features in the first quadrangle the old library now used as a large lecture-room is the chief. This fine long room of the fifteenth century, lit on two sides by Perpendicular windows, has a superb barrel ceiling moulded in stucco, dating from the reign of Elizabeth. Into the ceiling are worked small pendant lanterns on a diaper ground studded with Tudor roses, and the shields with colours of the fifteen colleges founded when the ceiling was completed add a warm touch of heraldic colour. At the south end are emblazoned the Royal arms of Elizabeth, and at the other those of Archbishop Chichele. Between the windows the walls are panelled, and here until the Codrington Library was built were kept the College books and MSS. The modern hall, which forms the connecting link between the mediæval College and the great quadrangle is essentially an eighteenth-century structure, semi-Classical in design, with a minstrels' gallery at the east end and a raised daïs at the other. The six windows are now filled with stained glass, designed by Mr. Kemp and executed by Messrs. Powell, to commemorate notable members of the foundation—Christopher Codrington, Christopher Wren, Lord Chancellor Talbot, Bishop Heber, Blackstone and the late Lord Salisbury, whose portrait as Chancellor of the University hangs on the west wall. Other notable portraits are those of Archbishop Sheldon, Jeremy Taylor, Linacre and Max Müller, while the only extant portrait of the poet Edward Young, famous as the author of "The Night Thoughts," with many others, may be seen here. The great quadrangle to the north of chapel and hall worthily completes the College buildings, and points to the last great expansion that took place from 1700-50. Before that date the ground was occupied by small cloisters, similar in design and scope to those at New College, and a large garden known as "The Orchard." It was the munificent benefaction by Christopher Codrington of the library which bears his name, a notable scholar and soldier of the Revolution period, which decided the College to embark on an extensive scheme which, after much criticism and discussion, resulted in the present noble square. The mediæval cloisters were swept away (though their memory is preserved by the long piazza which makes the west side); the library was placed to form the north line, while to the east a block of buildings for public purposes and Fellows' quarters completed the design. Hawkesmoor, the favourite pupil of Wren, was the architect, and his twin towers surmounting the east side are amongst the most conspicuous features in Oxford. They have been much criticised as a barbaric departure from the Gothic style they profess to illustrate, and certainly their detail is as original as it is quaint. They bear a strong resemblance to Hawkesmoor's work at St. Anne's, Limehouse, and if at first they impress the spectator rather by their oddity than

their beauty, most would admit that they are extraordinarily effective. Familiarity, too, with their peculiar characteristics inspires affection, and no one who has lived long under their crocketed pinnacles would wish to alter them for the most orthodox Gothic type. About Hawkesmoor's work on the library, however, there can be no two opinions. Both within and without the design is impressive and singularly beautiful, and as an example of Italian Gothic it is not surpassed by any building in Oxford or, indeed, England. Those who know the Medici Library at Florence and Wren's Library at Trinity College, Cambridge, can see at a glance whence Hawkesmoor drew his inspiration, but he has so handled the creative idea as to make his treatment an original and inspiring contribution to the wonderful wealth of architectural form in Oxford. The proportions throughout are faultless, and the austere scheme of colour blends to perfection with the design as a whole and with the restrained decorative treatment of the details. If I may quote words I have used elsewhere—to see this library is to love it, to love it is a liberal education. And to-day the splendid room, lined with some 90,000 volumes, mainly in Law and History—the two subjects to the study of which the College is devoted—is a fit memorial to the benefactor who not only provided for its creation, but also endowed its maintenance. Two further features of the great quadrangle call for notice. Above the central entrance of the library stands the famous sundial of Christopher Wren, which registers the hours (when our climate permits) so accurately that until quite recently Oxford watchmakers would correct their clocks by it. Wren rightly is reckoned amongst the greatest of the past members of the College. Although he was a Fellow for some eight years, the sundial is the sole external relic of his genius that the College possesses. The eighteenth-century expansion came too late for him to take part in it, but his appreciation of his membership is best proved by the legacy at his death of four volumes of his original drawings—a priceless treasure. These contain, amongst many plans and designs, notes and sketches never executed, most of his drawings for St. Paul's and other great buildings. The collection is unique, for in many cases—St. Paul's in particular—it is possible to trace the workings of the architect's mind from the first rough note or sketch through successive stages to the completed design, and no few of the papers also are filled with elaborate calculations in his own hand as to "quantities," material, prices and mathematical problems involved in the particular scheme. Needless to say, this record has been frequently studied by many leading architects and historians of architecture. Even to the most uninitiated layman they bear overwhelming testimony to the consummate draughtsmanship and imaginative fertility of their author. The second feature is the iron gateway in the piazza which leads into Radcliffe Square. The design of the ironwork is singularly beautiful, at once strong and light, and is a fine example of eighteenth-century work at its best. Tradition assigns it also to Hawkesmoor, but documentary evidence points to a slightly later date. Hawkesmoor, however, deserves to be remembered almost as much for what he did not do as for what he did. Fired by the success of the great quadrangle, the College seems to have entertained seriously the idea of transforming the fifteenth-century quadrangle on lines not unlike those of Queen's College just down the street, and in the archives are a set of plans for carrying the idea out; but compared to-day with the strength and simplicity of what has fortunately been preserved these drawings do not carry conviction. This brief sketch therefore could not be ended more fitly than by quoting the architect's own words when consulted on the scheme; and the present generation of Fellows who have endeavoured to act on them may thank Hawkesmoor for his courage and wisdom. "I must ask leave," he wrote, "to say something in favour of ye old quadrangle. . . . Utterly destroying or barbarously mangling it would be useing ye founder cruelly and a loss to ye present possessours. . . . What I am offering at in this article is for the preservation of antient durable public buildings, that are strong and usefull, instead of erecting new fantasticall perishable trash, or altering and wounding ye old by unskillf
knavish workmen." These sentences may certainly
recommended to all in whom the passion for "resto
tion" is strong.

## ILLUSTRATIONS.

### DESIGN FOR NATIONAL MUSEUM OF WALES.

THIS design, by Mr. Martin S. Briggs, A.R.I.B.,
was mentioned by our critic some weeks ago as
of those singled out from the very large number submit
in this much discussed competition by originality of tre
ment. A comparison of the block plan and the persp
tive, which we reproduce, shows the principle controll
the whole design. Its author, after studying the s
came to the conclusion that a building forming part
so symmetrical a scheme—a scheme so magnificent t
recent critics have said that nothing vies with it in t
or, perhaps, any country—must in some way be relat
not only to the adjoining City Hall, but also to the U
versity College frontage and to the Law Courts.
solution was arrived at by asking a mental questi
Whence is the finest view of this museum to be obtain
and how is its silhouette to affect its surroundings?
has therefore boldly set back his main frontage on
west so as almost to obtain a width of roadway and gr
in front equal to that between the City Hall and L
Courts, and so as to allow a view of the façade of Univ
sity College from the gardens between this great block
buildings and the shopping streets of Cardiff.

It is a question how far this sacrifice of space to p
duce a monumental effect has caused the internal econo
of the museum to suffer, whether the facilities for
passage of heavy specimens up and down the galle
are sufficiently considered.

The award in this competition has decided once
for all a point which apparently worried competit
great and small, experienced and inexperienced; for
the opinion of three famous and unbiassed masters
planning, the reserve collections and exhibition galle
should be on the same floor, and the public should h
access to all floors of the building. Mr. Briggs is by
means original in his interpretation of this requireme
and even among those mentioned favourably by our cr
a majority of competitors have carefully separated
reserve collections' and students' rooms from the fl
on which all the exhibition galleries open to the pu
are placed.

It is the controlling idea, the disposition of mass
and the breadth and dignity of the conception, which h
played the principal part in the settling of this gr
trial of architectural wits rather than minor details
planning or elevation; and for any further description
such matters we refer the reader to the drawings the
selves.

### OXFORD COLLEGE SERIES, ALL SOULS.—HALL—LIBRARY.

WE continue this week our illustrations of All So
College, and the completion of the histor
description is given on p. 367. We shall give furt
views of this college in the next and subsequent issues

Mr. Weir, architect, acting on behalf of the Society
the Preservation of Ancient Buildings, has exami
St. Peter and St. Paul's Church, Watford. He reports t
many repairs are needed. Several parts of the structure
in a serious condition, and he mentions that "the bell fr
is of oak beyond repair, and the beams supporting it
unsafe." He estimates the cost of the work at 700*l.*,
states that in case of urgency the work might be divided
four sections.

A sub-committee of the Leeds Education Committee
a conference with the architects of the new training col
with a view to progress with the building works. The
at Kirkstall Grange was viewed from all points, and
transpired that the plans are so far advanced that the lett
of tenders for excavations can shortly be advertised.
levels are made, and trial borings show that excellent foun
tions can be obtained on the ganister.

## ZINC OXIDE.*

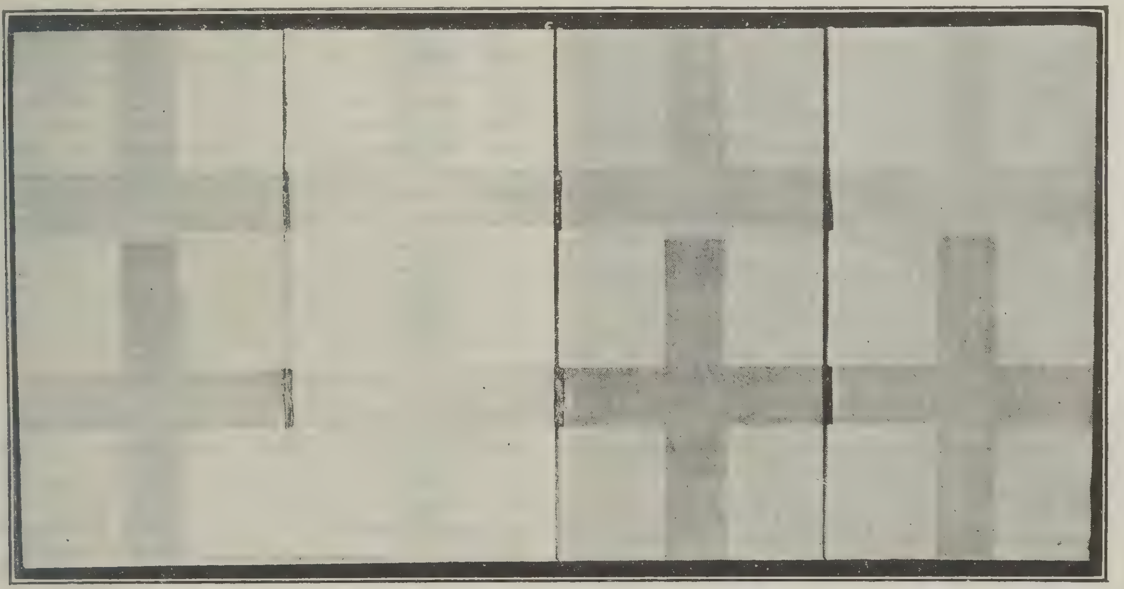
*(Continued from last week.)*

IT is useless here to attempt to find in chemistry an explanation of these facts. Physical explanations alone can solve this problem. Unfortunately the majority of our chemists in the laboratories of public administrations and industrial concerns neglect these considerations. These are allotropic states different from the matter, that is to say, modifications in the nature of the crystallisation. An oxide of zinc, as I have said, may be chemically pure and yet be of no use whatever as a pigment, consequently it is undeniable that the physical state has a preponderating influence. Also from the chemical or chemico-physical point of view the presence of a certain matter in small quantities has a great influence on the physical state. For example, zinc oxide manufacturers by the "indirect" process, in using the metal, know quite well that better white is obtained when starting from the residues of galvanic liquors than when starting from ordinary pure zinc. So most probably do the lead salts (in traces) modify the product which is obtained direct from the ore: the pigment is softer, more opaque, and has a better oil assimilation. These are not only remarks, but absolute facts. To give you an example. As an illustration to what I have advanced let me for one instance take you away from zinc oxide to iron. Is pure iron used in our constructions to-day? No. What is employed is an impure iron containing silesium, carbon, &c., which is called steel, and which is very superior indeed to pure iron as regards resistance, hardness, &c.

Are we not going in that direction more and more every day with the metal steel containing vanadium, &c., employed on our *Dreadnoughts*? Paint grinders on the Continent have for many years past realised the qualities of well-made "direct" zinc, and do not seem to attach any importance to the small percentage of lead salts. The administrations abroad are also going in this direction: in Belgium, Holland, Sweden, Switzerland, the Government specifications admit of 4 per cent. of lead salts. The case of the Belgian State Administration is practically interesting: the Belgian Government, following the example of many others, was anxious to prohibit the use of white lead for its work; specifications were drawn up, fixing the maximum amount of impurities in zinc oxide to 1 per cent. This was supplied according to specification, but the reports were not satisfactory, and the officials entrusted with the trial almost indicated their intention of continuing to use white lead. It was then that the manufacturers of the "direct" process zincs drew the attention of the Belgian Government to their products. After much difficulty these specifications were altered allowing 4 per cent. of lead salts, and after a careful trial, the "direct" zincs finally demonstrated their superiority over white lead. It was then decided by the State to employ it exclusively, and the question of coming back to white lead is "ancient history."

It must be clearly understood that the same results cannot be obtained by mixing mechanically 2 to 4 per cent. of white lead with pure ZnO. To obtain this molecular disposition, it is essential that zinc oxide should be formed in an atmosphere where lead is present and where every particle of ZnO is intimately married to an infinitesimal proportion of lead salts. From this results a very noticeable modification of the physical state: a kind of micro-crystalline formation, easier to obtain in the presence of lead salts than in their absence. A fact also which fully demonstrates the importance of the physical state and is well known to grinders is that "direct" zinc, though exhibiting a creamy appearance in the dry powder, does not turn so yellow in proportion when mixed with oil as the "indirect" zincs, proving again the superior pigmentary value of the former over the latter, and also the complete and irrefutable demonstration of the importance of the micro-crystalline state, of which no specification and few chemists take any notice. A commission of experts appointed in Holland to investigate questions relating to the suppression of white lead has given a number of interesting reports in connection with this point. The experiments extended over a period of five years, and careful comparisons were made as to the relative merits of white lead lithopone, "indirect" ZnO, and "direct" ZnO. The results of these tests clearly demonstrated the superior durability, covering power, and economy of the "direct" ZnO. It is curious to notice, however, that in the early stage of the experiments the chemical analysis had not been in favour of the "direct" ZnO. In the manufacture of "direct" zinc there enter undoubtedly several secret processes which are unknown to the uninitiated. These secrets unquestionably lie in the special gauging and composition of the fusion layers, and I know this is practised in Europe in well-organised factories with consummate care, whereas in America little or no attention is paid to it, and it seems evident to me that great improvements could be effected were it not that in America the main object is the spiegel and not the ZnO. Many of you gentlemen will imagine that I hold a brief for "direct" ZnO, but I can assure you that such is not the case: if I have focussed your attention on the merits of this product I have done it with a disinterested motive.

It is the humanitarian point of view principally which has led me to think that the supremacy of harmless zinc oxide over poisonous white lead can best be obtained by comparing it with "direct" zinc, which is better in colour, better in body and covering power, and practically as cheap (in fact, in some cases it might be cheaper) than by comparing it with "indirect" zinc, which is much dearer. Having touched on the humanitarian side of the question, I cannot help saying a few words as to its importance. That white lead is a most poisonous substance will not stand any argument. Statistics drawn up by various Governments and careful inquiries have established the fact beyond discussion. Other products in



A.—White Lead (English). B.—Direct Zinc Oxide (Dutch). C.—Direct Zinc Oxide (American). D.—Indirect Zinc Oxide (Silesian).

FIG. 8. (See p. 354.)

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* A paper read on May 12 before the Paint and Varnish Society by Mr. Gaston Depièrres.

daily use, you may say, are poisonous: quite so—that I admit, but probably no substitute has been found for them, whereas such is not the case with white lead, and if to-day its use were completely prohibited the world would still go round, we should be none the worse for it, in fact, much better without it. Already the consumption of white lead in Sweden, for instance, is one-seventh that of white zinc. France has completely forbidden the use of white lead, Switzerland is following her example, and Belgium, Holland, and Sweden have for the last few years opened a most strenuous campaign against white lead; in fact there is little doubt that in a few years' time all the Governments of civilised nations will follow the good example set by France.

Gentlemen, I emphatically declare that it is possible to do without white lead, and any man who doubts this is certainly twenty years behind his time.

### *Combination of Zinc with Linseed Oil.*

A chemist of great renown, who has carefully studied the subject, said to me that it was an admitted fact that zinc in the state of oxide enters into combination with linseed oil, not only in the state of zinc salts, but also as an organo-metallic compound in which the zinc combines with the double combination that linoleic acid possesses. Moreover, to saponify linseed oil, the theoretical quantity of zinc oxide required is 14.1 per cent. of the oil employed, but really it is possible to arrive at incorporating 20 per cent. of ZnO in the said oil. This excess of zinc combining with oil cannot possibly go and fix itself elsewhere than in the double combination of the linoleic acid. That zinc in the state of oxide under certain conditions combines itself with linseed oil as zinc salts or organo-metallic combination, no doubt can exist. This combination is almost instantaneous when oil is carried to 590° Fahr. and already begins at 450°; at this temperature the reaction is already fairly active. In the cold the same thing most probably happens, but much more slowly, and one may attribute, no doubt, the hardness of zinc paint to this reaction, which in the cold is more rapid when the paint is exposed to the outside, and subject to aqueous condensation and sudden changes of temperature which facilitate the rapidity of the reaction by the fact that hydrolysis may help the combination of the zinc with the linoxine.

These are the proofs that I can give you of the combination of zinc oxide with linseed oil. I believe this theory to be sufficiently well established to at least engage the attention and careful study of all competent men interested in the subject. With regard to the resistance of zinc paint to salt water, it must be admitted that the saline emanations have a direct effect on the ZnO, because zinc oxide is transformed fairly easily in the presence of sodium chloride NoCl into chloride of zinc. This reaction cannot be very well explained, but has been noticed. I have been unable to turn up the literature dealing with this subject; all I know is this—that there is formation of a double salt fairly complex between the chloride of sodium and the oxide of zinc, and that finally the oxide is changed into chloride which, in its turn, combines itself with a fresh molecule of oxide. Some of these double combinations have been studied and explained by "Mailhe," Bulletin de la Société Chimique de France (Vol. 25, p. 796, 1901); (Vol. 27, p. 651, 1902). These zinc salts vary in their combinations, and their solubility varies likewise.

$$\mathrm{ZnCl,\ 3\ ZnO+3\ H_2O}$$
$$\mathrm{2\ ZnCl_2\ ZnO+3\ H_2O,\ \&c.,\ \&c.}$$

These salts, when crystallised, may be described as having properties similar to plaster, i.e., they become hard and insoluble and more resistent. It is a salt having some analogy to this which is formed on Leclanche's batteries. Many of you who have seen these batteries must have noticed that the zinc of the battery is covered with a white deposit which is very hard and insoluble. It is most probable that by the action of saline emanations there is formation of oxychlorides of zinc. These have the property of becoming very hard, and, as you know, are often employed on that account for luting, chemical apparatus, and for stopping teeth in dentistry. They are also in some cases used in the manufacture of paints. Lead also, I am quite aware, gives oxychlorides. One is obtained by precipitating lead acetate with sodium chloride NaCl, or by digesting lead oxide in a solution of sodium chloride. I have not found that these oxychlorides of lead have the same property of hardening, which is a characteristic of the oxychlorides of zinc. In these facts, no doubt, are to be found the greater resistance of zinc paints as compared with lead paints when exposed to saline emanations.

Personally I quite admit that, with our present physicochemical knowledge laboratory experiments are not an absolute proof, but though results will naturally vary with the different qualities of zinc oxide employed, I feel sure that all practical men will agree with me that—provided a good quality of zinc oxide is used—it will in every case assert by a long way its superiority over white lead.

Gentlemen, what I have just said will, I trust, give you some idea of the extent to which ZnO can be utilised in the paint industry as compared with white lead, and if the work I have done in connection with this subject is of any use to paint manufacturers and users who join hands for their mutual benefit with the co-operation of the Paint and Varnish Society, I shall be amply rewarded for my pains.

*(To be continued.)*

## MANCHESTER SOCIETY OF ARCHITECTS.

THE first of the summer visits of the session, to Gawsworth, in Cheshire, took place on Saturday, May 28. Owing to the wet weather the attendance was small, and outdoor sketching was out of the question. The interior of the church, however, with its unique roof, which retains the original colouring, and the monuments of the Fyttons, were found very interesting, and the exquisite setting of the three old halls, the church and the three lakes among the luxuriant spring foliage was very much appreciated. The great hall of the rectory, with its fine timbering and its roof open to the ridge, was also inspected. A passing visit was paid to Macclesfield Church, which has considerable remains of the original Perpendicular church, some fine Perpendicular and Jacobean tombs in the Savage chapel, and a modern nave by Sir Arthur Blomfield.

On Tuesday evening, May 31, the visit to Bramhall was attended by over thirty members, under the leadership of Mr. Roger Oldham. The church of St. Michael and All Angels, the work of Messrs. J. Gibbons & Son, of Manchester, was first visited. The nave, chancel, and south aisle are now nearing completion, and a portion of the woodwork is in position. The drawings for the complete church, which provide for a tower, a north aisle, and an extension of the nave westward, aroused great interest. On leaving the church the party walked through the woods to Bramhall Hall, where they were met and conducted round the fine half-timbered hall by the owner, C. H. Nevill, Esq., J.P., who described in detail the history of the hall and the restorations which he has carried out. On this occasion the delightful weather contributed in no small measure to a most enjoyable evening.

## THE RESTORATION AND RECENT DISCOVERIES AT THE GUILDHALL, LONDON.

AT a meeting of the Royal Society of Arts on Wednesday, June 1, Mr. Sydney Perks, F.R.I.B.A., F.S.A., read a paper on the above subject. The chair was occupied by Mr. Philip Norman, who, in his introductory remarks, said:—

We all know the Guildhall as a busy centre of civic life, where the Lord Mayor with various leading citizens carries out the most important work, where he exercises unbounded hospitality, and where he gives the opportunity to the great men of the world from time to time of telling us home truths, which perhaps we had better take to heart. (Hear, hear.) But the Guildhall as an actual structure appears to most of us, though we know it more or less, rather modern and perhaps not having any very great interest. That is the first sight. Partly because we are imbued with the idea that all the buildings on the site on which it stands were burned down in 1666. We hardly realise—in short, we do not realise—that not only some but a considerable portion of the Guildhall remaining standing and various other buildings of considerable importance were only damaged in the Great Fire and not destroyed. For instance, the hall of the Merchant Taylors' Company, as regards its walls, is a Mediæval building. Though it has been very much modernised, the kitchen there appears to be partly Tudor in style. There is a crypt there of the fourteenth century. Then, again, various City churches show Mediæval remains. At St. Mary-le-Bow there is a Norman crypt and there are parts of towers of churches. There were also two most interesting crypts of important houses. There was Gerrard's Hall, and there was the crypt of the house of Sir John de Pulteney. The Guildhall has existed on its present site from what I may call time immemorial. The accomplished surveyor of the building, Mr. Sydney Perks, has since his appointment shown great energy and research. He has studied the history of the building, and with his architectural knowledge he has been able to find out very important remains which had practically been forgotten.

Mr. Sydney Perks then read the following paper, which was copiously illustrated:—

It would be no idle boast to claim that the Guildhall is a unique building, for although it was formerly the scene of more historical events of the greatest importance than it is to-day, it is still the centre of great civic movements, and its usefulness has increased in many ways. It has a wonderful record, meetings of citizens to decide even the fate of kings, trials of State, treason, and murder, the reception of sovereigns and statesmen of note from all parts of the world, forming a grand roll of fame. It might be said that Westminster Hall has a history to rival it, but Westminster has lost even its courts of law, a footfall echoes in it, and it lives almost only as a monument of the past, whereas the work and importance of the Guildhall increase from day to day, it throbs with life and is the hub of a city far mightier than it ever was. The old order gives place to new, the work and usefulness being ever adapted to the moment.

But it is not the historical or political record of the Guildhall that we are interested in to-night; it is the story of the building. A book by J. E. Price was published in 1886; it is entitled "A Descriptive Account of the Guildhall of the City of London." With a large part of that work I am not concerned, but I think Price is incorrect in certain statements he makes about the building, and I do not agree with him that the entire main hall was not built at one time. My belief that he was wrong has come about gradually. I think he jumped at conclusions without proper investigation, and he was certainly handicapped by not having had the training of an architect, as even an elementary knowledge of building construction is so useful when tracing the history of a building.

I believe the Guildhall was built at one date, and that no portions of former buildings were incorporated with the structure. My belief is based upon conclusions I draw from the writings of Stow and others, from the examination of old maps, plans, and views, and from the recent exposure of parts of the old building in connection with which I have had the honour to be associated; I propose placing my evidence shortly before you.

Little is known of any Guildhall erected before the present building; there was a previous structure apparently with a frontage to Aldermanbury, and I have heard it suggested that the west portion of the crypt was part of that Guildhall. This matter I deal with later, but it is well to note that the present Guildhall was considered a remarkably big building at the time it was erected, and the cost crippled the finances of the Corporation for several years. It is about 160 feet long, the west front is about 150 feet from Aldermanbury, the west portion of the crypt is about 79 feet long; consequently, if the old Guildhall buildings extended from Aldermanbury to half-way along the present building, the length was no less than 229 feet, or 69 feet longer than the existing building. This is hardly in keeping with the record in Fabyan's "Chronicles," which states:—"In this yere (1411) also was ye Guyldehall of Lodon begon to be newe edyfied, and of an olde and lytell cotage made into a fayre and goodly house as it now apperyth."

Again there is an interesting reference to the new building in the "Calendar of Letter Books," edited by Dr. Sharpe, of the Guildhall. On page 3 of Book I. it states that the new work of the Guildhall had ceased; it was commenced, as we know, in 1411, and the entry is dated 1413; it speaks of the scandal and disgrace to the City not to be able to continue the work, and to find a remedy; the important part is this:—"The Mayor . . . and the Aldermen . . . in their Common Council assembled in the Upper Chamber of this Guildhall"; this must refer to the previous Guildhall. How could they assemble in the present building in 1413 when we know it was not completed until about 1422, the year when the executors of the celebrated Dick Whittington contributed towards "the paving of this great Hall twenty pounds, and the next year fifteen pounds more to the said pavement with hard stone of Purbeck; they also glazed some windows thereof and of the Mayor's Court, on every which window the arms of Richard Whittington are placed"?

Surely the extract of 1413 seems to imply that the Common Council decided, as sensible men, to keep the old building up while the new one was being erected, and if they did that how could the west end of the crypt have been part of the previous Guildhall that "olde and lytell cotage" we have already heard of?

Again, Stow, who wrote in 1598, states:—

"This olde Bery Court or hall continued, and the Courts of the Maior and Aldermen were continually holden there, until the new Bery Court or Guildhall that now is, was builded and finished" and "I my selfe have seene the ruines of the old Court hall in Aldermanbury streete, which of late hath beene imployed as a Carpenters yard etc."

Maitland, in his book of "The History of London," writes:—

"The Mayor and Court of Aldermen considering the many inconveniences arising from, and great Obstructions given to, the public Business of the City, which daily increased with Inhabitants, occasioned by the Want of Room in that despicable Cottage the Guildhall in Aldermanbury, set about erecting the present Guildhall; which is a spacious Structure, well accommodated for the transacting of all publick Affairs belonging to the City."

This extract is certainly in keeping with the idea that the old Guildhall had a frontage in Aldermanbury, and that the present building was erected independent of the old structure.

The Guildhall appears in several old views and maps. Van den Wyngarde's View of 1543 shows a building without louvres or buttresses, and with a battlement; these old views are obviously sketchy, and too much reliance must not be placed upon them. The same artist's view of 1550, which is preserved in the Bodleian Library, and Agas's Map in the Guildhall Library, are both illustrated in Price's book. Norden's View, of 1600, indicates that the parapet to each gable was ornamented with crockets, a common feature in the fifteenth century, but not reproduced when the building was restored in 1876. Visscher's View, of 1616, also shows crockets and the two flèches. A plan made by Overton in 1666 shows, by the clear white spaces, the buildings destroyed by the Great Fire, and the line of limit is clearly marked. This plan is most valuable, as it indicates a building at the east end of the great hall. Pricke's plan of 1666 is similar to Overton's map and is of the greatest interest. In Leake's Survey of 1666 the buildings are, unfortunately, not shown, but the "Back Passage to Guild Hall" is marked; the map is valuable, as it confirms statements made by Stow and Maitland which I refer to later. John Overton's map of 1676 also shows the back entrance from Basinghall Street, and for the first time we see King Street, which was constructed as an approach to the Guildhall in 1666. The plan taken from Rocque's map of 1737-46 is more carefully prepared than those of an earlier date; it shows the back entrance to the Guildhall, and also indicates the steps down from Guildhall Yard to Cut Throat Alley. Nearly all these illustrations are part of the Crace Collection at the British Museum; several of them can also be seen in the Guildhall Library.

The old views of the exterior show that the appearance was roughly similar to what it is to-day. After the Fire Wren added a storey and provided the hall with a flat ceiling, and there are many views both of the interior and exterior showing the appearance of the building until the present open roof was built by Sir Horace Jones in 1864. He followed, as far as possible, old traditions, but in place of two small ventilators, he fixed one large *flèche*. Although this is very effective from a distance, it is open to criticism in that it has the effect of somewhat dwarfing the appearance of the front or the Guildhall Yard.

The views of the Guildhall, prepared by Ralph Agas in the reign of Queen Elizabeth, and Hollar in 1647, show the Guildhall had two ventilators, dividing the ridge into three lengths; these were given by William Hariot, mayor, and cost 40*l.* Visscher's and Norden's views also show these two *flèches*.

I have prepared plans of the crypt and Guildhall above, showing them, as far as I can judge, as they were when first built in the early part of the fifteenth century. With regard to the crypt, the eastern half, by far the most elaborate portion, is very little different to-day from what it was nearly 500 years ago. It has quite recently been restored; until then the walls and vaulting were covered with dirt and grease, the shafts supporting the vaulting were quite black, and it was only after the removal of the grease and dirt that the colour of the blue Purbeck stone shafts could be seen. This eastern crypt was more expensively constructed than the western portion, it was probably used for certain meetings, and its importance was emphasised by the fine entrance, which is quite as elaborate as the fifteenth century porch. Until about two years ago it was boarded up and completely obscured, the upper half by a lavatory, while the lower portion of the doorway formed the side of a perfectly dark lumber hole, only accessible through a trap door. Now a new staircase gives easy access to the crypt, and we can see the fine mouldings of the piers, the niches, that no doubt held statues, and many other interesting details. Massive iron hooks still remain on which the heavy doors were hung. The bar that held them in position swung back heavily when unhooked, for a circular line was worn on the stone jamb, and can be seen to-day. This doorway was about 7 feet 10½ inches below the level of the Guildhall yard, and approached by a flight of steps, no doubt of stone. Excavations have been made recently, but no traces of these steps could be found; it was hoped there might be some lines showing where the stones were built against the outer wall of the porch, but none appear. The excavations were, however, only made along a small portion of the wall, and there may be traces along the remaining part. We are more fortunate with the indications of the access from the crypt door level to the floor of the crypt, for the old stone lines may still be seen, and the new staircase was kept well clear of them.

The question of the date of the eastern and western crypt is of the greatest interest, and, as Price states the eastern crypt was the crypt of the old chapel, it may be useful to criticise the evidence he lays before us. He states that a chapel was built about 1280, and used as a chapel until 1429; it was then discovered it "had become too small for the requirements of the citizens flocking to hear divine worship," and that Henry VI. accordingly "granted letters patent to pull down the old chapel, but as the crypt beneath the old chapel was substantial, it remained, and is the present eastern crypt." But surely he forgets the Guildhall was commenced in 1411, paved in 1422, and glazed in 1423, and the porch erected, "last of all," in 1425. How could the chapel above the crypt have existed where the Guildhall is now until 1429 when the entire Guildhall, on the same site, was finished about 1425? When Price suggests that this portion of the crypt belonged to an early chapel, we cannot help thinking it seems unlikely that a little cottage, like the previous Guildhall, should have so large a chapel, and further, does it not seem strange that if this portion was incorporated in the Guildhall in 1411, having an area of 5,291 square feet, that the new chapel erected in 1429 should only have an area of 4,234 feet, or 1,057 feet less? Let us also face the fact that the old chapel "had become too small for the requirements of the citizens to hear divine worship."

There is a theory that this eastern crypt was used as a chapel, and a little recess at the eastern end may have given rise to that idea. A few weeks ago, brickwork that had been built across the doorway opposite the main entrance was removed, and the steps and other details uncovered. These steps, which were also covered up, probably led to some official portion of the building.

It is often suggested that the cross wall, which divides the crypt in two parts, was not built at the same time as the vaulting was constructed in one of the two halves. This has been used as an argument by those who have advocated the theory that a part of the crypt formerly belonged to a previous building.

The western half of the crypt is supposed to have collapsed during the Great Fire, and Wren is credited with the restoration. This theory is no doubt correct. The architect, whoever he was, proceeded to rebuild the vaulting necessary to support the floor of the hall. He did it in the quickest way possible; he did not replace the old stone vaulting, but simply built a brick wall at each end of the space to be covered, and just inside the old stone walls, one being the cross wall and the other the west external wall, and in doing so he built up all the old stone responds, &c., and they have been hidden from 1666 until a few weeks ago. Wren then built a series of brick arches, similar to a range of railway arches. He filled up the haunches and replaced the floor. The workmen filled in with any stone or brick débris handy, and hundreds of beautiful Gothic fragments exist to-day in these brick walls. While removing the brickwork to uncover the Gothic work a very large number of the fragments have been carefully removed and labelled, and are ready for depositing in the museum. Of course it was a great pity the Gothic work was bricked up, but in a certain sense it is to our advantage to-day, now that these links with the past have been brought to light, for the bricking up process has preserved the stone and also the ironwork of the windows; the work is now exposed after a lapse of 240 years, and we see the sharp edges of the stone-work, &c., which we could not have done had the work been handy for mutilation and exposed to the atmosphere. Consequently, I think in a certain sense we may be grateful to the City authorities of centuries ago for their vandalism.

When clearing out some of the débris filled in just below the paving of the hall, I found a few pieces of stone, smooth and well worn on one side, tooled and rough the other side. They are portions of paving stones, and are Purbeck, and no doubt formed part of the paving of the hall, paid for in 1422 by the executors of the celebrated Dick Whittington, and referred to above.

To return to the cross wall of the crypt. An examination of the responds at the angles of the western half shows each cap is formed of one stone, and beyond the stone the return faces are built so as to bond into the stonework. The square line of the cap stone is fair with the face of each wall, clearly showing that the cross wall was built when the east portion of the crypt was built. Another proof is the fact that the wall ribs of the vaulting are quite different from the main ribs at the crossing between the piers. In the latter case the face of the rib is 2½ inches wide, but where it is built into the cross wall it is 13 inches wide. I think these two facts clearly show that the eastern part of the crypt and the cross wall were built at the same time.

The next step is to prove that the cross wall was built at the same time as the vaulting in the western half. This was not so easy, because Wren's brick wall hid all the old stone work. I had some of this brickwork removed at the points where the old stone ribs must have joined the cross wall, hoping to find some link still existing if the work was carried out at one date. In order to do this a small portion of the paving of the great hall had to be removed. Afterwards I opened up below and found the old springers of the cross and diagonal ribs; all of them are there, built in and forming part of the old cross wall, and they will not be bricked up again. The discovery of these springers has revealed the necessary clue; they are of the greatest importance, for they prove conclusively that the whole crypt of the Guildhall, from end to end, was built at one date.

I found one other interesting point when opening up at the side of one of the piers in the main hall: the floor level was originally 6 inches lower than the existing floor; these 6 inches must have been very useful in adding to the effect of the bases which are now rather squat in appearance.

In the crypt where the wall is thickened, being the wall under the doorway between porch and hall, and the fourth bay from the west end, there are some springers that puzzled Price, and as he could not understand them he assumed they formed part of an earlier building. The ribs are similar to the remains of other ribs, and the reason they spring from the main wall without any respond as in other cases is because the wall is so much thicker here; they are also of necessity wide apart, as the line of junction with the wall is at a plane in advance of all the other points of springing.

One very remarkable feature is the vaulting in the centre bay at the eastern end of the east crypt. This is much higher than any other portion of the vaulting, and certain opinions are given at length in Price's book; his theory was that the floor above was originally higher, and that every bay, except the one in question, was lowered in order to have the floor of the Guildhall about 1 foot 9 inches lower than that of a previous building. Unless the previous vaulting had collapsed, it is hard to understand why such expense should be incurred for so trivial an object. We know it was usual in mediæval halls to have the daïs higher than the remainder of the floor, and bearing that in mind, the builders may well have raised the vaulting in this one instance to clear a high door which we see at the eastern end to-day, knowing that the difference in level would not affect the structure over as the daïs would in any event be higher than the body of the hall. The windows in this eastern half of the crypt differ in some respects from those in the western half, and just as the vaulting was more expensive and the whole construction of a more ornamental character, so we find the windows in the eastern half were glazed, while those in the western half were not glazed, but they had stout stay-bars outside, and the usual rebate for internal shutters.

With regard to the western half of the crypt from the time of the Great Fire onwards, this portion of the building has not been treated with the kindness it had a right to expect. It was always evident, from the responds along the side wall, that this portion of the crypt was vaulted. Price quotes an opinion that "of any columns to support the centre of the floor we were unable to discover a trace."

Last December I took up some paving in a direct line between two responds, and one-third of the way across the crypt. I carefully cleared away the earth, and just below the surface I found the foundations of a pier that supported the vaulting; at once I opened the paving in the corresponding positions, and in every case—there are eight in all—I found the foundations I wanted. The result is we now know exactly where the piers existed and the number of them, we can tell from the responds that the vaulting ribs spring direct from the shafts without any caps, as at Fountains Abbey, and every detail is at hand to enable the Corporation to restore the entire west end of the crypt so that we could see it as in the fifteenth century. I also cut away the brickwork at the west end and was delighted to find the two responds I wanted in an excellent state of preservation.

Another very interesting discovery was a three-light window in the west wall of the building; this was entirely bricked up. It was, apparently, the only three-light window n the west end of the crypt. A portion of the cill remains. This is yet another link in the chain of belief that the building was an independent structure. Had the Guildhall been an extension of a previous building, we might have looked for a loor here, but according to this discovery, apparently, there was no communication from the west end of the crypt. The doorways show communication, north, south and east. The east doorway shows a rather peculiar state of things: apparently the opening was first intended to be of the width shown, and then it was decided to make it narrower, and build the dividing wall between the crypts across part of the jamb; this was done, and on taking away this portion of the wall the old structure, covered up since it was built in 1411, shows as sharp an arris as if it had been worked to-day: in other words we see the jamb of the door which has been hidden for 500 years.

There is a very interesting staircase from the crypt to the side of the porch, which is almost entire. Needless to say it was partly bricked up until a few months ago. The entrance at the crypt level still has stout hooks, and the ceiling is simply vaulted by stones leaning against one another, a straight joint running from end to end.

As stated above, the whole of the western half of the crypt was constructed in a much less expensive manner than the eastern half. The windows have simpler heads, and were not glazed—glass was a luxury in those days; the piers of the vaulting were in ordinary stone and not Purbeck as in the eastern half, and there were no caps. It seems to me a possible reason for the difference is that the eastern half was constructed for ceremonial purposes, and the western half for muniment purposes or domestic work. This may or may not be so, and I advance the theory as a practical solution of a difficulty. We get the magnificent entrance to the eastern half of the crypt, and we get the narrow little staircase of the side of the porch to the western half. This at once suggests what is now known as a trade entrance, and the two doors close together on the north side indicate that access was sought to one portion of the crypt by persons who did not wish to pass through the other portion. In 1501, kitchens were erected at the north side of the building, opening off the western portion. Later on, the western end of the crypt was used for stables, for we read in 1683 that two aldermen were requested to report upon the "mischiefs arising from the keeping of a stable and a coach-house under the Guildhall."

The vaulting in the western half of the crypt is not planned conveniently for the main shafts above; in other words, the responds for the vaulting are not under the piers in the hall, but along each side wall there are other responds which are immediately under the piers of the great hall.

It has been suggested that this part of the crypt, being a portion of an earlier building, was retained when the great hall was erected, consequently it was necessary to add responds to support the piers above, cutting through the vaulting of an earlier date.

This theory is I think incorrect. I had the necessary brickwork cut away and the stonework cleaned, and it was seen that the wall rib of the vaulting and a portion of the additional pier adjoining have been cut out of one stone, in other words the vaulting and all responds were built at the same time. I have tested this in more than one place.

I had been puzzled for a very long while about the two stone staircases found in the thickness of the wall at the east end of the crypt. They start from the level of the east doorway, which was about 5 feet above the floor of the crypt, and turn outwards at a height of about 15 feet above the floor of the crypt. Nowhere have I seen any explanation for them. Price simply states that they communicated with the hall above the crypt. He evidently did not go up the stairs; had he done he would not have made such a mistake, for he would have found they turned outwards at the top, and not inwards. A possible solution seems to be this. I found at the British Museum in the Crace collection the maps of Overton and Pricke; these have been referred to above and clearly show a building, apparently about 50 feet by 50 feet, at the east end of the Guildhall. These stairs built, as was often the case, in the thickness of the wall, clearly show a connection between a building joining the east end of the Guildhall and the crypt. If a building did exist on that site in the fifteenth century built apparently at the same time as the Guildhall, it seems likely that some connection should have existed between the main hall and that building. The plan of the hall shows a circular staircase at the north-east corner. Until a few weeks ago this was blocked at the foot by a boiler and had not been used for very many years, the dust and débris being many inches thick on the treads. But on going up I found a doorway, bricked up as usual, opening outwards into space; this probably communicated with some building.

There is a similar doorway in the south-east turret leading into a complete small room. There was no staircase in this angle, consequently this room could only have been approached from a building at the east end of the Guildhall. In the circular staircase, about the level of the great hall, there is also a doorway; this was bricked up, and on removing the brickwork I came upon a passage about 23 feet long, 3 feet wide, and 8 feet 5 inches high, which was also blocked with stone work, but the filling in was removed with great care, and it was found the passage led into the great hall, passing through a buttress on the way. At a little expense, this ancient way can be restored, and communication opened up between the hall and the crypt, which will be very useful for entertainments, &c.

The following extract from Maitland's History, Vol. II., may be of interest:—

"More to the south is Guildhall Court, which is well built and inhabited by the chamberlain, town clerk, and some other officers chiefly depending on the city business transacted in Guildhall. This court has a thoroughfare into Guildhall Yard, that opens between the hall and the chapel, and it leads into the great hall by a back stairs."

There is further proof of a building or buildings at the east end of the hall, for there is evidence in the records that a house was approached by the lower gate. We read on February 20 in the fifth year of the reign of King Henry VI. that "John Penchricke, the mayor's esquire, should have and hold the house or mansion situate above the lower gate of the Guildhall of the said city, and which John Merchaunt late held and inhabited, to have to him so long as he shall have behaved himself in his office, &c., without paying for it any rent."

This lower gate is possibly the smaller entrance door on the south front shown on the illustrations previous to Dance's work, or more probably it was the entrance already referred to from Basinghall Street which Stow calls "the backe gate of Guild-hall." To quote Stow again, we read:—"The foundation of the Mayor's court was laid in the thirde year of the reign of Henry the sixt, and of the porche on the south side of the Mayor's courte, in the fourth of the said King. Then was builded the Mayor's chamber, and the Council Chamber, with other rooms above the staires." We also read, "for a further monument of these late times, men may behold the glass windows of the Mayor's Court in the Guild-hall above the stairs." It seems likely that the stairs in the thickness of the walls and in the north-east corner are the stairs, or some of them, that Stow refers to.

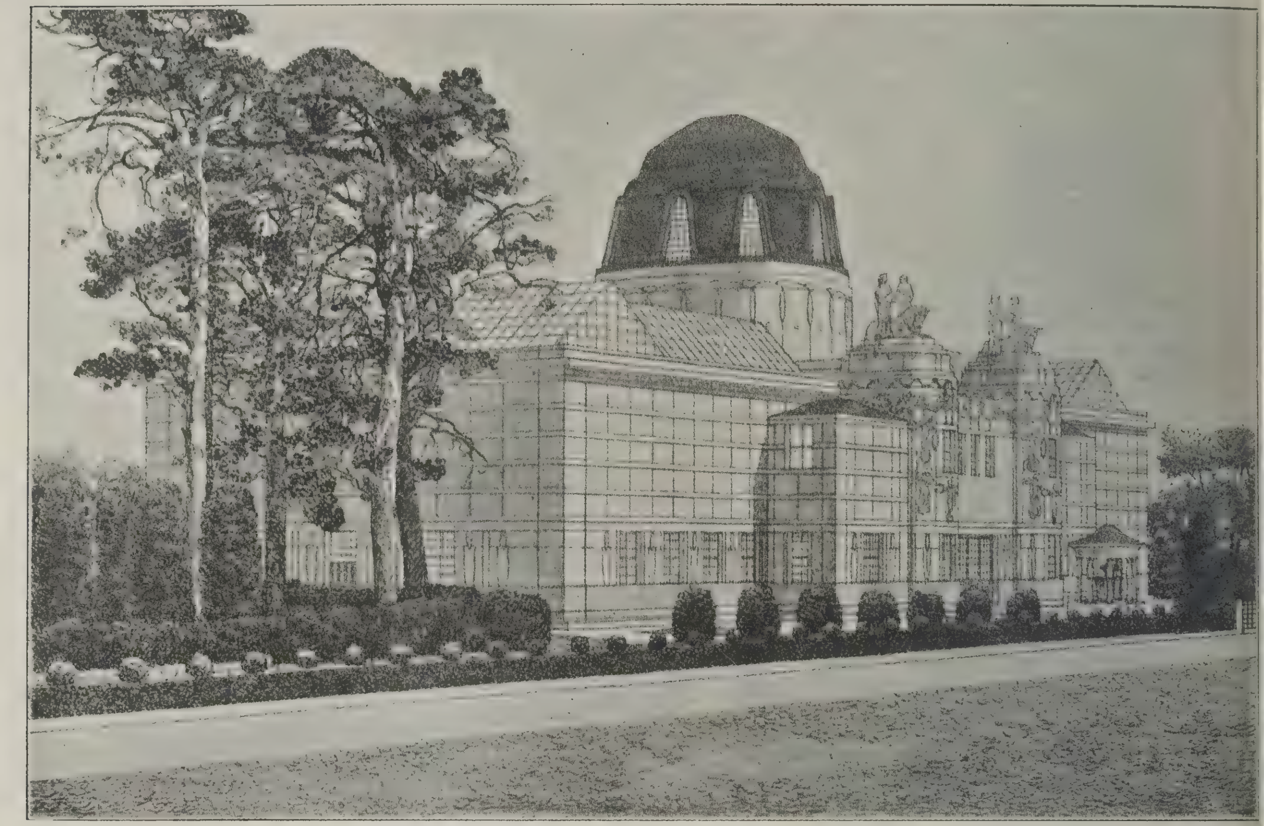
It will be seen that two porches were referred to by Stow, one being the main entrance and the other the porch to the Mayor's court, &c., the latter being built slightly earlier than the main entrance. We know also that the windows of the Mayor's court were glazed in the same year as those of the great hall; consequently it is clear that when the Guildhall was being erected other important buildings were being constructed at the same time. A large scheme was evidently in hand, and it is also obvious that the great work of the Corporation could not have been carried on in the large hall and crypt, for in addition to the Mayor's court there were several other courts.

Richard Blome, who wrote shortly after the Great Fire, states "the roofs, floors, and what else was therein were consumed. These rooms, courts, and offices are appropriated to the same place, wherein they were kept formerly, but much more regular and loftier and more substantially built."

There is quite an interesting little history in connection with the east end of the ground floor of the building. Slide A shows the window as it is to-day with three main divisions, heavy transom, &c. Slide B is an old view showing the window as now and with Wren's flat ceiling and extra tier of windows. Slide C shows the interior at an earlier date with the lower part of the west window filled in with stonework and a monument against it. Slides D and E are photographed from prints in the Guildhall library. It will be seen the window is quite different in these illustrations; there are seven lights and no transom, consequently I naturally thought that the window had been renewed at some time, but I could find no reference to the cost. However at the British Museum I traced two views of a State lottery held at the Guildhall, shown in

## MODERN EUROPEAN ARCHITECTURE.

### AUSTRIA.



[From *Der Architekt.*

DESIGN FOR A PICTURE GALLERY AT REICHENBERG.—By Herr H. Ried, Architect.

slides F and G. Apparently the illustrations are about the same date as slide E, and the illustrations are referred to in "Political and Personal Satires," Vol. III., part 1, No. 2,435. These lottery views show the window as it exists to-day. I hacked a little of the cement work away outside the window and found the old stone cills, mullions and transoms underneath. The result proves that although the old window has been practically renewed, it follows the lines of the original. I have also seen at least one other incorrect view of the window, apparently made during the eighteenth century. These inaccurate old illustrations often give one a lot of trouble, for it is not advisable to rely upon their evidence alone. The stonework was very much decayed inside, and elaborately pieced about the year 1870.

Just under the great window there is a very fine stone canopy; this delicate piece of work can only be properly seen from a ladder, as the projection of the canopy of the wood screen below hides the view of it except from a distance. About the same level as the top of the wood panelling there is a horizontal line at the springing of the stone canopy. It is probable that tapestry was hung below. Stow relates that "Nicholas Alwyn, mercer, Mayor 1499, deceased 1505, gave by his testament for a hanging of tapestrie to serve for principall dayes in the Guildhall 72*li.* 6*s.* 8*d.*" There are also other references; one relates to the "hangyng and garnysshyng of the over and higher parts of the Guildhall." Consequently, there seems little doubt that the hustings were formerly hung with arras. Slide E shows the stone canopy at the back of some wood panelling which Wren erected, and his screen across the hall. Wren had the good sense to design his panelling so as not to obscure the stone work, which, unfortunately, is so hidden to-day.

In 1838 there was evidently a Gothic revival, for Wren's work was swept away, and William Montague, the City surveyor, or "clerk to the City's works," prepared an excellent "design for finishing the east end of Guildhall." I have the drawing in my office. The design was prepared to include three figures from the exterior of the Guildhall chapel which are now in the Guildhall museum. It is rather difficult to tell if the niches were altered by Montague; on the drawing, entire canopy is coloured with a different tint to the port below; the colours are, however, very faint, but in c sequence of the State lottery views and the excellence of work, which is very similar to portions of the crypt entra I am inclined to believe the canopy dates from the erection the building. It is beautiful work.

Now we come to what we see to-day. The east end two return sides on the hustings are panelled in oak. panelling was copied from a screen in Newark Church, I think it was a great mistake to destroy Montague's des in stone and erect a copy of work which, although excelle was erected under entirely different conditions. Again, proportions of the panels, &c., have been altered to make fit in, and the effect is much inferior to the original screen Newark.

It will be seen that the woodwork has a heavy project canopy, and this is immediately under the stone canopy. result is that not only does the wood canopy prevent any near the east end from seeing the stonework above, but we two heavy horizontal lines immediately under the wind which have the unpleasant effect of dwarfing the end of hall. It is apparent to the most casual observer that woodwork forms no part of the original design, for we see canopy immediately under another, a senseless arrangem very detrimental to the dignity of the hall.

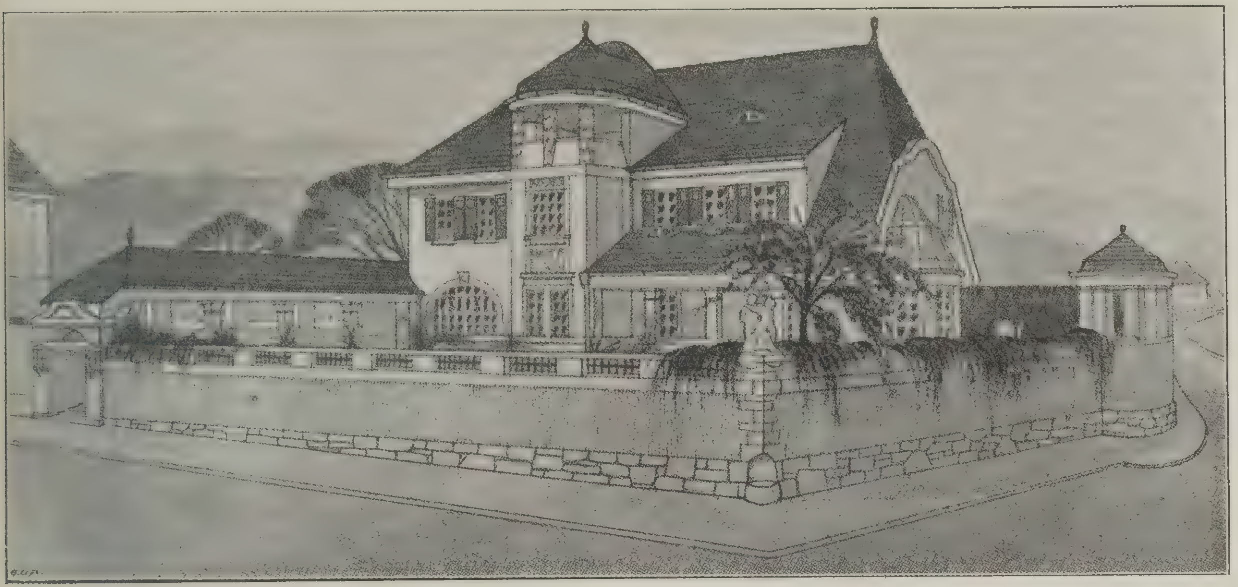
Personally I should very much like to see a return to arrangement of hanging tapestry round the east end, w return ends as far as the steps of the hustings. I think woodwork should all be removed and the arras hung, as doubt it was in the fifteenth century. At present the space the back of the panelling is a receptacle for an enorm amount of dirt and dust, which cannot be cleared away wi out taking down the screen.

Last autumn I had a small portion of the panell removed and some hangings submitted to members of City Lands Committee, and the result was favoura received. As there was so much work in hand the matter not pressed, even by members most in favour of a return the old state of things, but the subject is well worth care consideration and might well be brought up again.

(*To be concluded.*)

## MODERN EUROPEAN ARCHITECTURE.

### AUSTRIA.



[From *Der Architekt*

DESIGN FOR A SUBURBAN HOUSE AT SIEVERING.—By Herr RUDOLF EISLER, Architect.

## SOCIETY FOR THE PROMOTION OF ROMAN STUDIES.

THE inaugural meeting of the Society for the Promotion of Roman Studies was held in the lecture theatre of the Civil Service Commission, Burlington Gardens, W., on Friday, June 3. The chair was taken by Dr. F. G. Kenyon.

The first resolution was, "That a Society be formed for the Promotion of Roman Studies." Dr. Kenyon in moving its adoption, said that in October last a letter appeared in the Press signed by the President and Honorary Secretary of the Society for the Promotion of Hellenic Studies, asking for help towards the establishment of a similar body for Rome. Sufficient response was given to encourage them to go forward. A number of meetings had been held since then by persons interested in the project and different people expressed different views as to its realisation; but there was no difference of opinion as to the desirability of such a step being taken. One of the practical difficulties was the multiplication of societies which more or less appealed to the same class of people. But none of the existing societies provided exactly what was required, more especially the publication of a journal devoted to the study of Roman art and antiquities, a library and a place where lantern slides could be stored. In the end a unanimous agreement was arrived at that an independent society should be formed for the promotion of Roman studies, independent, but at the same time working in friendly co-operation with other societies of a kindred nature. In coming to this agreement the champions of union and concentration among the different bodies were not asked to abandon their views. They hoped that this society would promote an interest in Roman studies, at the same time they looked forward to the time when the work may be combined in some general institute of classical studies. For the present their duty was to see that that particular society, whether as a member of a larger one, or as a body distinct in itself should be a healthy one. There could be little difference of opinion as to that fact. Living as we do in the midst of evidences of the Roman occupation of these islands, with Roman law, in part at least, as the basis of our law, and the Roman language, in part at least, as the basis of our language, the study of Roman civilisation must of necessity be of interest. The Roman Empire was an example of Imperial administration with which we naturally contrasted our own experience. In regard to the leaders of this movement the new society could face comparison with similar societies in other countries. All that was wanted was to extend interest and to raise the standard of knowledge among the various workers in Roman research throughout the country. In Rome they now had a British school with a director who had devoted his life to the work; but the possibilities of that school were still far from being fully developed. In England they had a number of workers who lacked a high standard of organised research. No doubt the very greatest scholars might feel they could do their work best in their own way, but the value of the society was co-operation, and co-operation was the distinguishing characteristic of scholars, and it was essential for the production of the best work.

The resolution was seconded by Sir Archibald Geikie, and was carried unanimously.

Professor F. Haverfield moved, "That the object of the Society be to deal with the archæology, art, and history of Italy and the Roman Empire down to about A.D. 700 by publishing a journal, forming a library, holding meetings, assisting (as soon as funds allow) the British School at Rome, and generally promoting the better knowledge and understanding of the Roman world." Professor Haverfield drew attention first to the scope of the new society. It was hoped that in future as a result of recent conferences, the field of classical scholarship would be divided into three parts—the history, art and archæology of the Roman world, which would belong to the new society; the history, art, and archæology of the Greek world, which would, as before, be the province of the Hellenic Society and *Hellenic Journal*; and the literature, philology, and grammar of the Greek and Latin languages, which would find expression in the *Classical Quarterly*, issued under the authority of the Classical Association. There might be—and, indeed must be—occasional overlapping between these provinces, but taken broadly the division would both correspond to the division of students' interests and would save labour and duplication of work. He pointed out why the new society would end its activity with the opening of the Middle Ages. The fields of Mediæval and Renaissance art and history were too wide to be included in the same area as Classical Roman studies; they were well provided with special journals, and the papers of the School at Rome would, as before, be open to articles dealing with them; indeed if these papers dealt with post-classical subjects, and with such classical subjects as concerned more especially the topography, &c., of Rome and its neighbourhood, the harmony between the new society and the School at Rome would be complete. He passed on to explain the scheme by which the Hellenic and Roman societies would (it was hoped) unite to found one library of classical history, art, and archæology. Such union would promote economy and result in the formation of a very valuable collection of books—and he would add the hope that if this collection could by any chance be brought under one roof with the library of the Society of Antiquaries, yet more economy and efficiency would follow. Lastly, he emphasised the need of supporting the British School at Rome, the one representative of British learning in the Italian capital. The Hellenic Society supported the School at Athens; the new society would play a part of almost national usefulness by helping to make the School at Rome more prosperous and efficient. With its field of work thus delimited and its activities thus harmonised with those of other societies, the Roman Society would have a noble opportunity for valuable work. Roman art might be a poor thing, but Roman architecture, archæology and history were three living studies of signal value to the world to-day. As Lord Cromer's paper on "Imperialism, Ancient and Modern," had lately shown, Roman history was full of meaning for modern statesmen. The field of the Roman Society concerned alike the patriot and the professor, and the harvest to be raised from it was in the highest degree both of national and of scientific importance.

Mr. Arthur Smith (Keeper of Antiquities at the British Museum) seconded the resolution, which was carried unanimously.

Professor Percy Gardner moved, "That the constitution follow *mutatis mutandis* that of the Hellenic Society; that the annual subscription be one guinea; and that for the present no entrance fee be imposed." It was, he said, obvious that their society should at all events begin by following the lines of the Hellenic Society. That body since it started has had to incorporate rules which were unknown at the commencement of its activities. Fresh fields were constantly opening out. But even if the Society had a good constitution it was none the less true that it must depend for its success on the efforts of those who are willing to spend time and money. He felt sure that there were a certain number of students who were truly anxious to make the society a success.

Mr. H. H. Statham in seconding the resolution said that while it had to be admitted that Roman archæology when compared with Greek archæology was less inspiring and less intellectual, nevertheless it possessed a very much wider sphere. Moreover, Pagan Rome has come down in a very real way to our own life. It was well to remember that the plan of the western Christian church has grown out of the basilica.

Lord Justice Kennedy proposed, and Professor F. Walters seconded the election of the following as members of a provisional committee, charged with the duty of drawing up a constitution:—Mr. S. H. Butcher, Professor R. S. Conway, Professor F. Haverfield, Mr. G. F. Hill, Mr. D. G. Hogarth, Mr. T. Rice Holmes, Mr. H. Stuart Jones, Professor J. S. Reid, Mr. A. H. Smith and Mr. H. B. Walters. This was agreed to. The hon. acting secretary is Mr. G. D. Hardinge-Tyler.

Mr. S. H. Butcher moved the following resolution:—"That it be an instruction to the Council of the Society, when appointed, to approach the Hellenic Society, the Classical Association, and the Schools of Athens and Rome, with a view to arranging—(*a*) for the conduct of the periodicals controlled by these bodies as friendly and allied publications normally occupying distinct provinces of learning; (*b*) for reciprocity with the Hellenic Society in respect of library, collections of lantern slides, and the like; (*c*) for the establishment of such further co-operation between the societies as may seem desirable and possible." He said that there were no fewer than five societies by which they were at present immediately served; these were the Hellenic Society, specially allied with the School at Athens; the new Roman Society, similarly in alliance with the School at Rome; and the Classical Association, which is not concerned with Greece or Rome exclusively but covers the whole field and has now fourteen or fifteen hundred members spread over the British Empire. Obviously it was a matter of great importance that they should do all that was possible to avoid waste, overlapping and duplication of material. It should be borne in mind that four archæological societies have each their own journal, and the Classical Association had three periodicals. It was desirable that the editors of these journals should meet or hold communication, and mark out the boundaries of their respective journals. With regard to a common library, they had already existing a very good library in that of the Hellenic Society, and it would be foolish to duplicate the costly works of reference therein. The main object of the resolution was to draw the union as close as possible betweeen the different societies. They did not want to have a number of disconnected bodies, and in the interests of learning as well as of economy they ought to establish an alliance. Fifty years ago it was the dream of Classical scholars to present Greek and Roman antiquities in the same building. Nowadays they had become aware more of the diversity of these great civilisations than of their unity. Beyond all doubt high specialisation is necessary to-day. But in spite of the different characteristics beween the two civilisations there is also a certain unity between the two. We ought and might look forward at no very distant date to a big work of reconstruction. In their own generation at any rate the members could help to form a society which will bring it about. They hoped to see formed an Institute of Classical Studies, and that in forming a new society they would at the same time be bringing together existing bodies.

Mr. St. John Hope, in seconding the resolution, uttered special warning at the danger of embarking on the formation of an expensive library. He knew of more than one society which had found the task to be a mill stone round their necks

Lady Evans moved as a rider that it should be an instruc tion to the new Council that they should consider the advis ability of approaching the Council of the Royal Numismatic Society with a view to the mutual use of libraries.

The rider was accepted, and the resolution with this addi tion was agreed to.

## OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* (New York) is devoted to the work of Mr. J. A. Schweinfurth, who also contributes the leading article on "Certain Requirements of Architectural Practice," which is, in effect, a short sketch of the writings of Vitruvius. The chief work of Mr. Schweinfurth's illustrated is the Wellesley College, Mass., where the architect has indulged in a variety of treatments in different buildings of the group, starting from Jacobean and following with adaptations of subsequent styles down to the twentieth century. Mr. Schweinfurth's work is based on that of many past periods and diverse localities, and is most successful when it approaches closely to its prototype.

*La Construction Moderne* (Paris) commences a description and gives several illustrations of the Oceanographic Museum at Monaco, of which M. Delefortrie is the architect, and which is remarkable not only for its position but also for the character of its detail.

The *Architectural Record* (New York), in its series of articles on the architecture of American colleges, now deals with Columbia University and other colleges in New York City. An interesting article is that on "Public School Architecture in Chicago," which is illustrated by plans as well as by photographic views.

*Berliner Architekturwelt* (Berlin) contains quite a number of competition designs this month, the subjects being the grand Opera House at Charlottenburg and the extension of A. Wertheim's Stores at Berlin. The Schloss Kniegnitz, by Herren Dinklage, Paulus & Lilloe, is symmetrical on plan, and dignified as well as picturesque in treatment.

*Engineering Record* (New York) has a description of the substructure and foundations of the Bryant Building, a New York skyscraper of thirty-one storeys on a quicksand foundation. The action of seawater on Portland cement is the subject of an article by Mr. J. M. O'Hara, of the Southern Pacific Laboratory, San Francisco, and is a useful contribution to research on a very difficult question.

## Correspondence

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

### Garden Cities, Suburbs, and Villages.

Sir,—These terms are often loosely used by our public Press, thus confusing some vital issues.

A "garden city" is a self-contained town, industrial, agricultural, residential, planned as a whole, and occupying land sufficient to provide garden-surrounded homes for at least 30,000 persons, as well as a wide belt of open fields. It combines the advantages of town and country, and prepares the way for a national movement, stemming the tide of the population now leaving the countryside and sweeping into our overcrowded cities.

A "garden suburb" provides that the normal growth of existing cities shall be on healthy lines; and when such cities are not already too large such suburbs are most useful, and even in the case of overgrown London they may be, though, on the other hand, they tend to drive the country yet further afield, and do not deal with the root evil, rural depopulation.

"Garden villages," such as Bournville and Port Sunlight, are garden cities in miniature, but depend upon some neighbouring city for water, light and drainage, have not the valuable provision of a protective belt, and are usually the centre of one great industry only.

Will you, in the interest of accuracy and of social progress, kindly assist in keeping these distinctions clear?—

Yours faithfully, Ebenezer Howard,
Director of First Garden City, Ltd.,
Letchworth, Herts.

20-23 Halton House, Holborn, London, E.C.: June 6, 1910.

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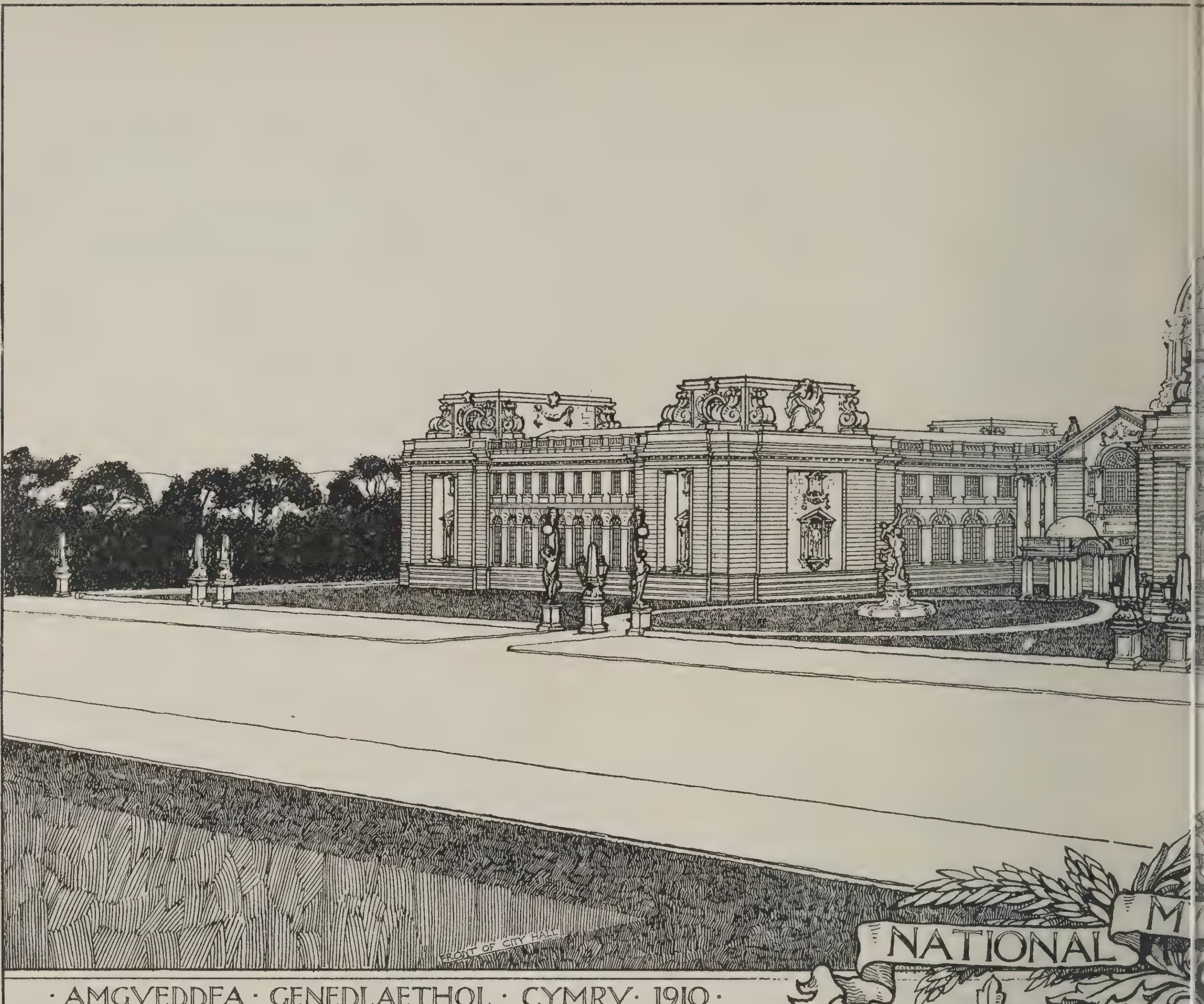

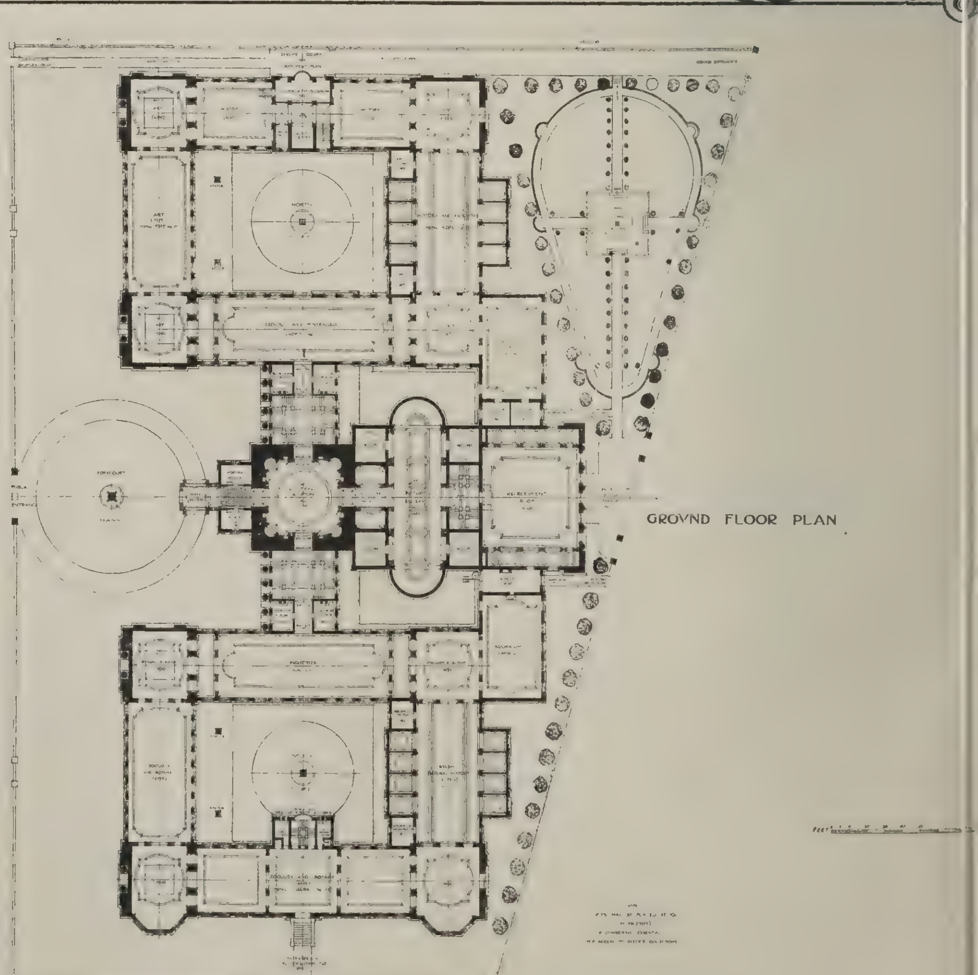

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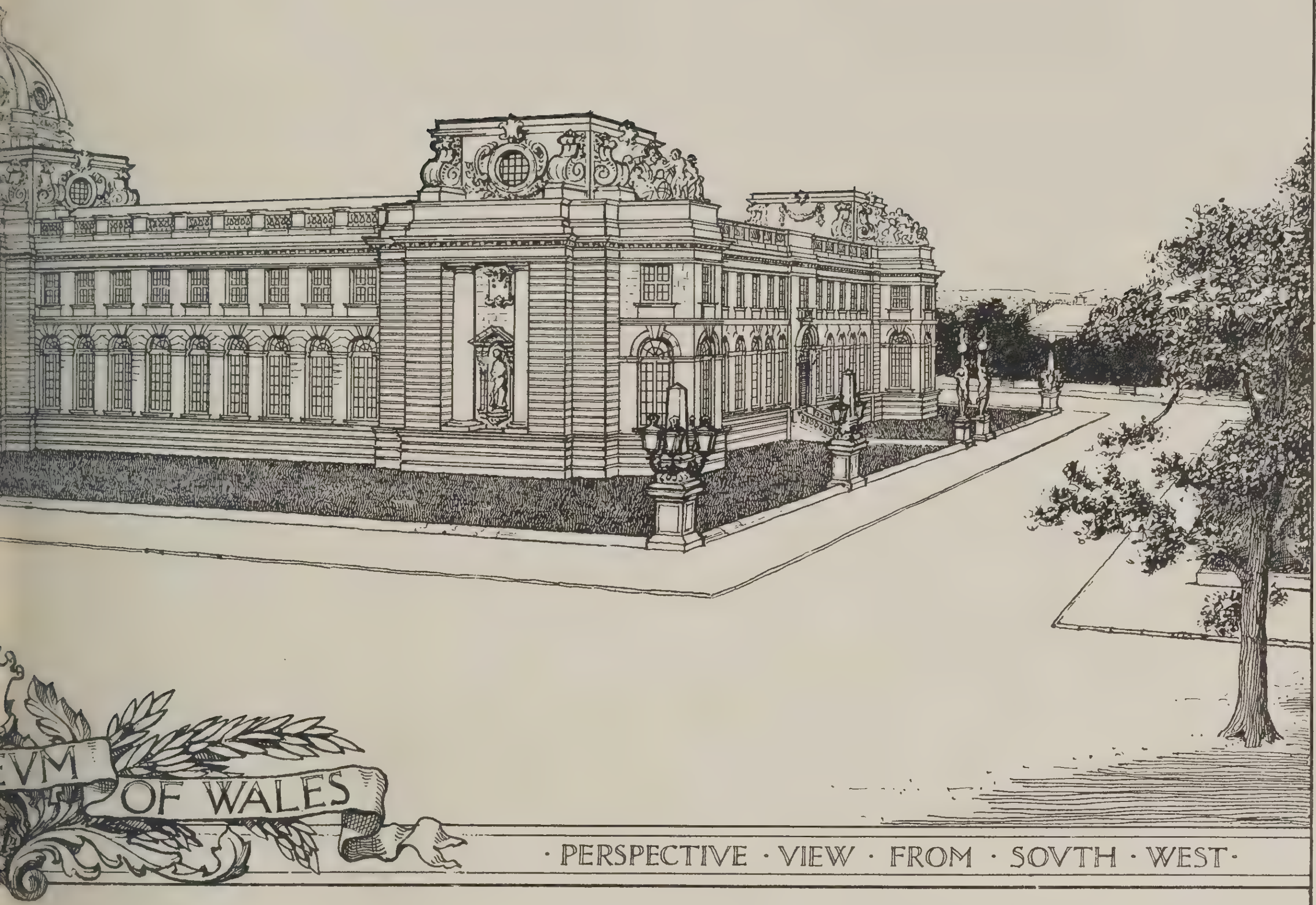

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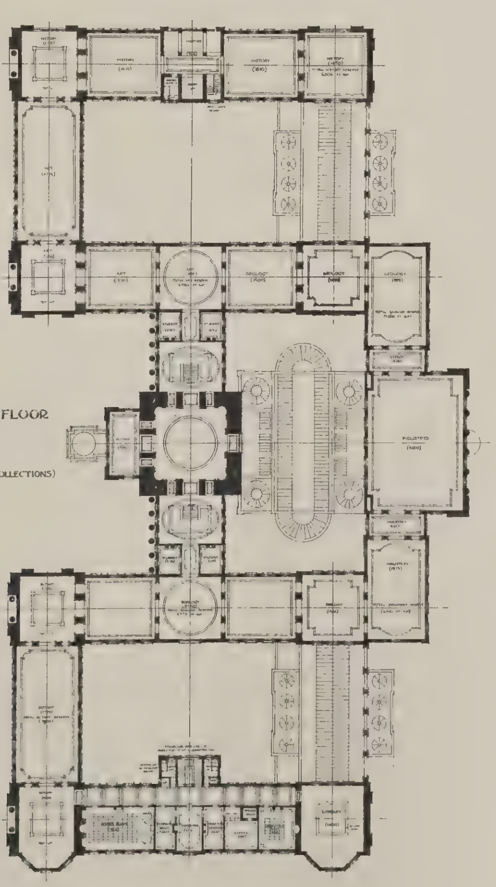

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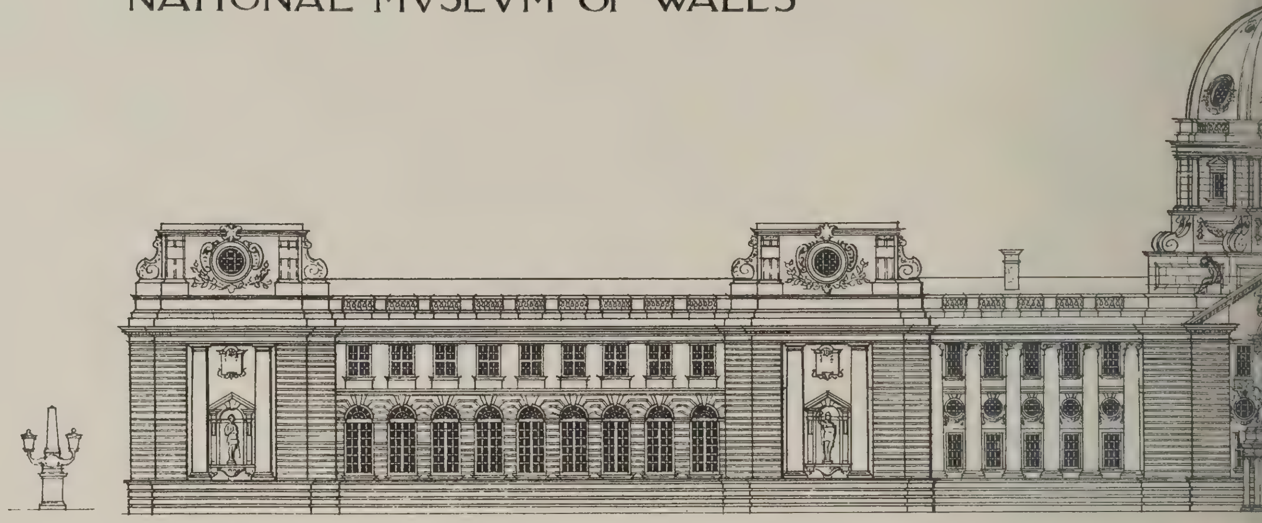

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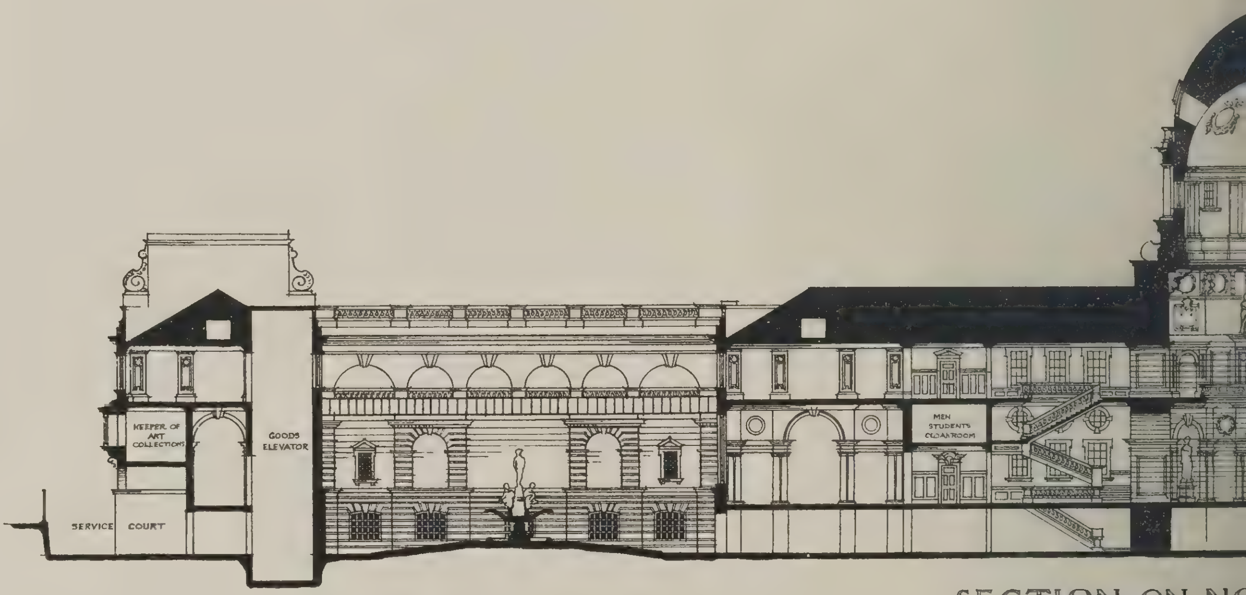

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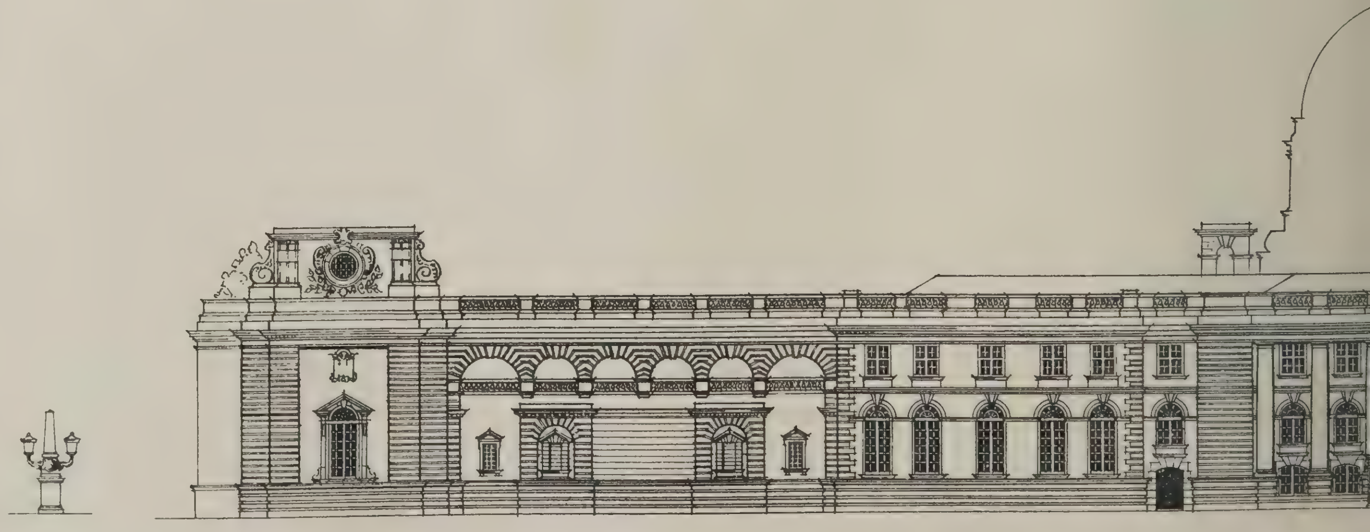

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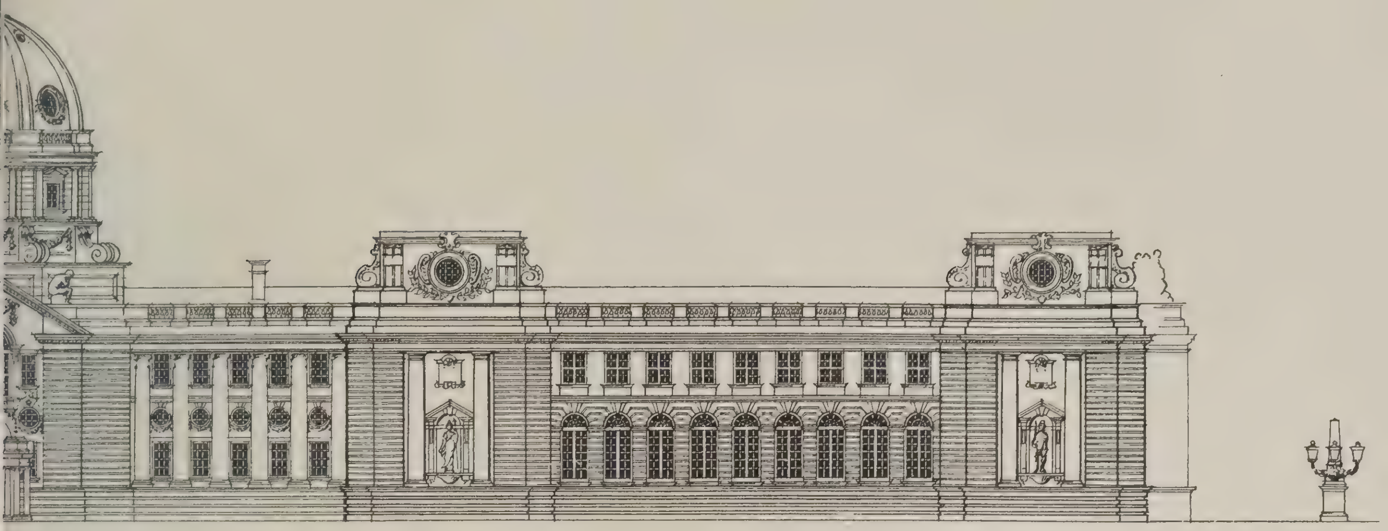

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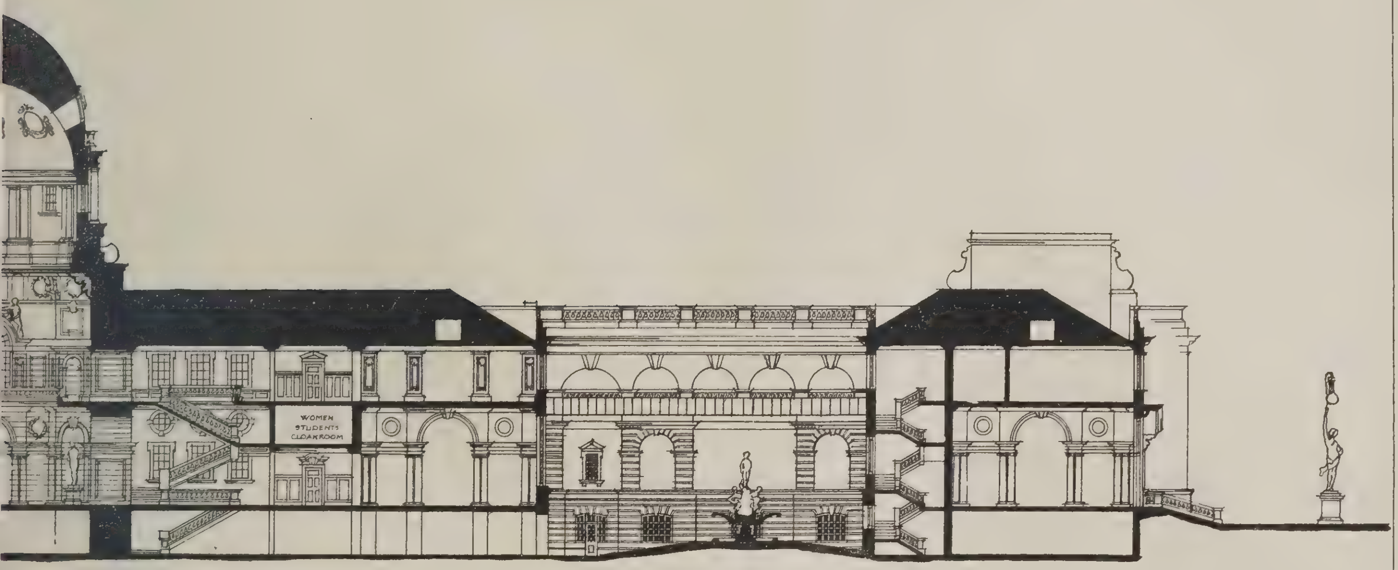

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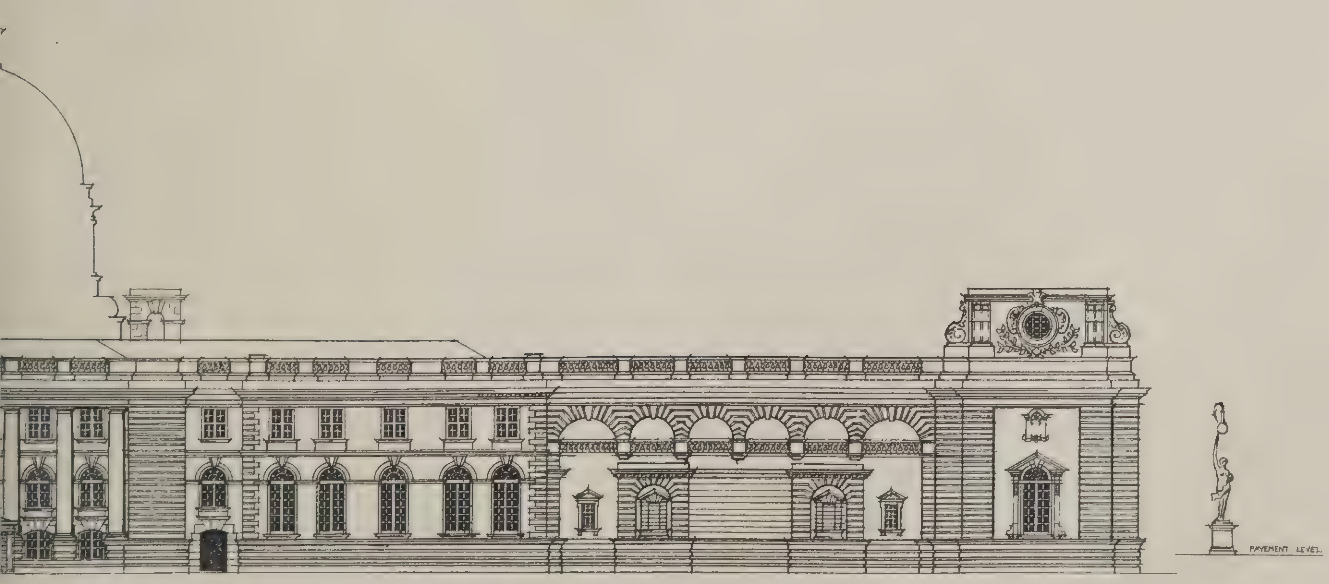

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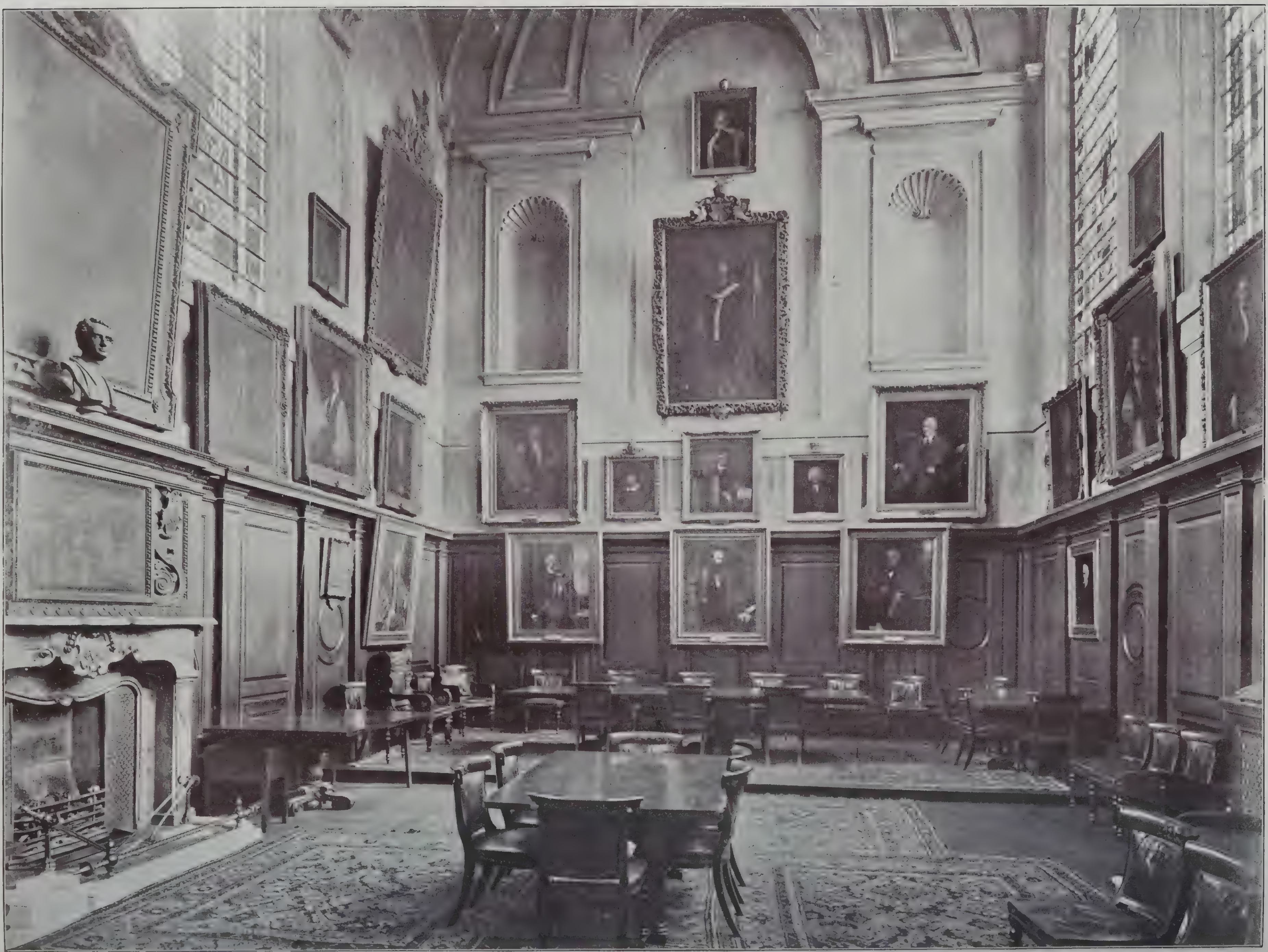

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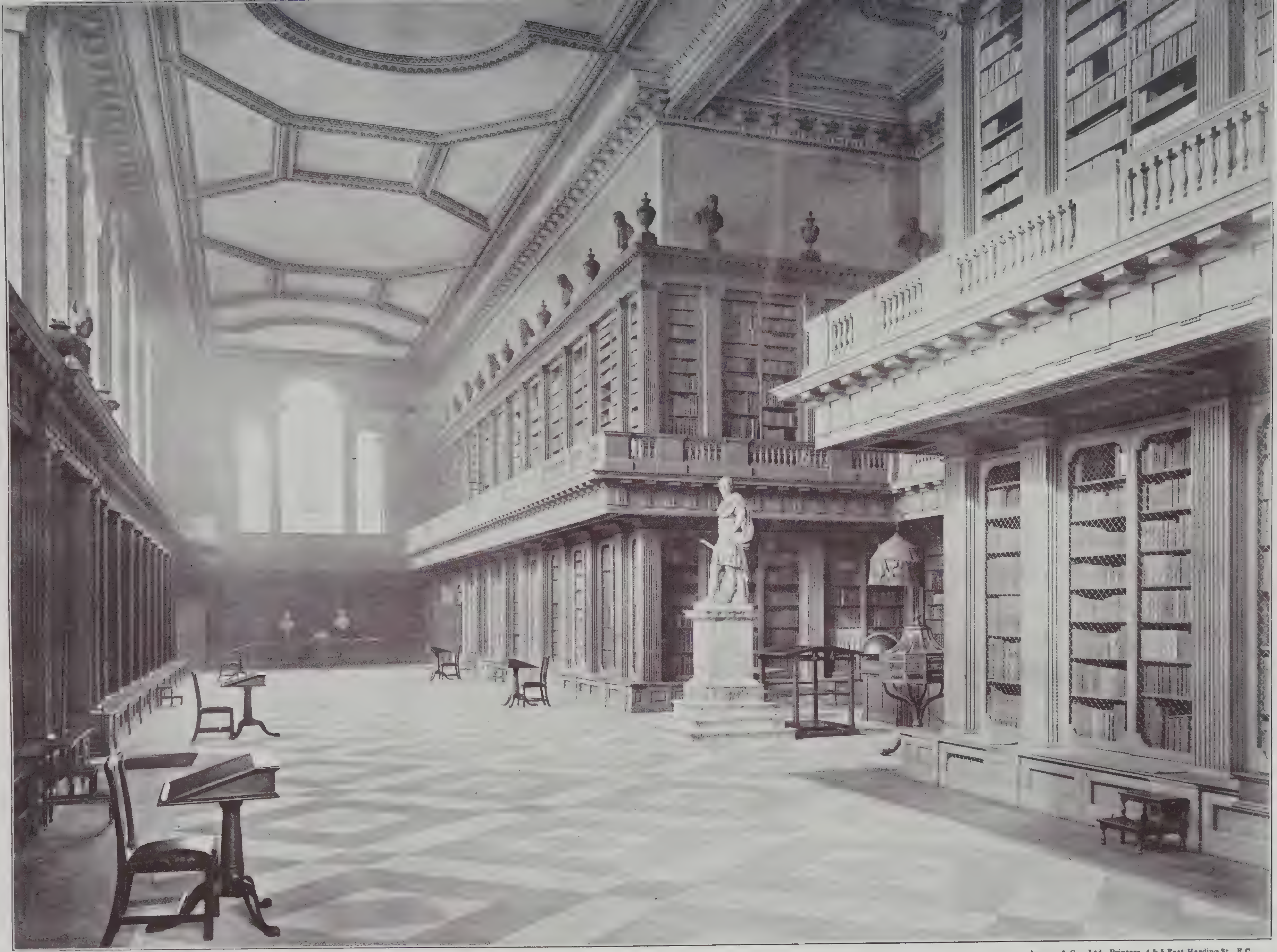

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# The Architect.

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## FORTHCOMING EVENTS.

*Monday, June 20.*

Royal Institute of British Architects : Presentation of the Royal Gold Medal to Mr. T. G. Jackson, R.A., M.A. (Oxon), F.S.A., for his executed work as an Architect.

*Tuesday, June 21.*

Institution of Heating and Ventilating Engineers : Summer Meeting at Bournemouth, and on Wednesday.

*Wednesday, June 22.*

Institution of Civil Engineers : Annual "James Forrest" Lecture.

Northern Architectural Association : Students' Sketching Club Annual Excursion.

*Thursday, June 23.*

Society of Architects : Visit to Japan-British Exhibition.

*Friday, June 24.*

Royal Sanitary Institute : Provincial Sessional Meeting at Dublin; and on Saturday. Discussions on "The Water Supply of Irish Towns" and "The Bacteriological Standards of Potable Waters."

## STUDENTS' DRAWINGS AT THE ARCHITECTURAL ASSOCIATION.

With the exception of the measured drawings of old work the competitive productions of the members of the Architectural Association cannot, on the whole, be regarded as satisfactory or as approaching the average standard of excellence of the past. In every case the prize has been easily won by drawings or designs that fall very far short of perfection or even creditable attainment. We are inclined to think that the day-school system of a two-years' course is to some extent at least responsible for this. Students now learn a great deal more of architecture in two years than they ever did before, but the inevitable result of forcing follows—the fruit is produced earlier, but it lacks flavour.

Another result of the school system is seen in the paucity of competitors for many of the prizes. The daily contact with each other in a school reveals to the students the identity of the probable winner before his drawings are even started, hence very often there is a feeling of despondency and hopelessness in the majority, and they either abstain or compete half-heartedly. The prizes of life, whether in school or in the world, are never won by the man who does not make his best effort with the sanguine feeling that his best stands a reasonable chance of success. These annual competitions at the Architectural Association are scratch races, not handicaps, and when the superiority of the scratch man is realised, as it must be in a school, the backmarkers stand down or are only out for an airing.

The A.A. Travelling Studentship (value 25*l.* and silver medal) has been awarded to Mr. V. O. Rees, whose draughtsmanship gives promise of future excellence, but is at present in the melting-pot, fusing the merits of English and French styles, but falling short of either. The measured drawings of the church of St. John the Evangelist, Westminster, are thorough and a good study of a design that is remarkable in plan and composition, but not to be admired in detail. Of the designs submitted by Mr. Rees that for a Renaissance pavilion and fountain is the best, but the elliptical staircase for a town house does not fall far short, and shows both adequate study and commendable invention. Mr. H. A. Ross has worked diligently, his measured subject being Gibbs's work at Trinity College, Cambridge, but both his draughtsmanship and design are markedly inferior to those of Mr. Rees.

The A.A. Silver Medal (together with prize value 10*l.* 10*s.*) has also been won by Mr. V. O. Rees for a design for a memorial archway and screen to a public park. This is arranged on a semicircular plan with three radiating roadways, one central and the others in the middle of the quadrants. The archway adorns the central roadway, and is treated by Mr. Rees with three equal-sized openings surmounted by an attic, which is rather too high for the arches. The minor entrances are kept quite subordinate and the semicircle terminates in pylons. The scheme is well conceived, and the author has a good idea of the use of detail. Of the other two designs submitted for the medal, that of "Olympius" is the better, but neither in general conception, in detail nor in drawing is either of these within measurable distance of the winner.

The Henry Saxon Snell Scholarship (value 50*l.*) has attracted the largest number of competitors, and the prize has been awarded to Mr. E. F. Ferry. Quantity rather than quality is the characteristic of the competition, and none of the competitors has given an ideal solution of the problem—a small convalescent home at the seaside for fifty children. The winner's design is the best, and, whilst the general arrangement of the various departments is good, the plans possess such grave faults as infants' dormitories looking south-west and beds poked into dark corners without ventilation. Attempts at prettiness rather than planning mar too many of the designs, and more attention has been given to the arrangement of gardens and even of paving stones than to considerations of service, control and aspect.

The competition for the Banister Fletcher bursary (value 25 guineas), awarded to Mr. B. F. Matthews, has brought out the finest set of drawings in the room, for which the author has measured the Queen Mary block at Greenwich Hospital in a most admirable manner, and rendered the results of his measuring in capitally prepared drawings, the full-size details and the half-elevation, half-section of the dome to half-inch scale being especially remarkable. The only other set of drawings in this competition, representing the Strand entrance to Somerset House, submitted under the motto "Jointing," is quite worthy of the prize, but has been unfortunate in meeting so strong a competitor as the work of Mr. Matthews.

The Architectural Union Company's prize (value 20*l.*) has also produced a spirited competition and excellent drawings. Mr. P. D. Hepworth has been successful with a very fine set of drawings of the Abbey Gateway at Bury St. Edmunds, in which the author has charmingly conveyed the spirit of mediæval English architecture, particularly in his delineation of carved ornament. A good, careful, and effective set of drawings of Sompting Church, by "Saxonia"; measured drawings of Horham Hall, near Thaxted, Essex, by "Persiste"; of Borwick Hall, Lancashire, by "Weaver," are all worthy of recognition for painstaking and thorough work, even though

AT BRUGES.—From a Sketch by Mr. J. Grey West

they must justly give place to the winner, either for importance and value of subject or for excellence of draughtsmanship.

The work of the first and second year divisions of the school, exhibited in the gallery, shows the maintenance of the style of pretty drawing that is characteristic of the Architectural Association present-day teaching. There is a great deal of very creditable work in the direction of design, for which the instructors appear to aim at novelty of subject, with perhaps too much persistency, for as the students of the school are perpetually changing it is scarcely necessary to depart extensively from the beaten track and set young fellows fresh from school to disport themselves in the by-paths of architecture and attempt to design Byzantine domes. Study of English stonework treatment is far preferable, but purity of taste should be one of the qualities that young students should be assisted to develope, which can hardly be done if they are fed on Byzantine, German Renaissance, or Buddhist design.

## NOTES AND COMMENTS.

In the case of the Guardians of the Poor for the Parish of Leicester *v.* Trollope, the latest proceedings in which we report elsewhere, a very important point for architects is raised, as to how far the architect of a building can be held responsible for negligence in the event of the duties of the clerk of works not being properly and sufficiently performed.

The credit that should be given to the author of a work of art is but too frequently withheld in the notices of such works that appear in the daily Press. Of this a remarkable instance occurs in the account in the *Times* of the unveiling of the memorial reredos to Canon Fleming in the church of St. Michael, Chester Square. We are told the cost of the reredos, the names of the gentleman who performed the ceremony of unveiling, of the officiating clergy and of several prominent members of the congregation present. The materials and subject of the reredos are described, and then we are told:—" The work has been carried out from the designs of Mr. E. Evans Cronk, and the modelling of the figures in the reredos was executed by a gold medallist of the Royal Academy on the staff of Messrs. Underwood & Co., who carried out the work." We cannot suppose that the omission of the sculptor's name is due to any other cause than the recognition of the fact that the readers of the *Times*, representative of the general public of Great Britain, are more interested in the cost of the memorial and in the materials of which it is made than in the identity of the artist to whom its beauty is due. Such is the love of art amongst the British public.

Birmingham is very much in earnest in town planning, and the City Council have not only adopted the report of the General Purposes Committee, that authority should be given to the committee to serve and publish the necessary notices of the intention of the Council to apply to the Local Government Board under Part II. of the Housing, Town Planning, &c., Act, 1909, for authority to prepare a town-planning scheme for an area comprising the parish of Quinton and parts of the parishes of Harborne and Edgbaston within the city and a portion of the parish of Northfield within the King's Norton and Northfield urban district, and to take all the steps in relation to such intended application as are required by Articles I., II. and III. of the Town Planning Procedure Regulations (England and Wales), 1910, but has resolved that the committee be requested also to consider whether a town-planning scheme should not be made for Saltley, Washwood Heath and Ward End.

The Town Planning Conference to be arranged by the Royal Institute of British Architects will be held from October 10 to 15 next. The President of the Local Government Board, the Right Hon. Mr. John Burns, has accepted the position of Hon. President of the Conference. Mr. Leonard Stokes will be the President and Mr. John W. Simpson Secretary-General.

At the opening of the centenary exhibition of the Liverpool Academy of Arts the President, Mr. J. Y. Dawbarn, M.A., drew attention to one very important aspect of the encouragement given to art by the British public. He urged upon his audience that, if they only considered for a moment, they would be compelled to admit that the Academy had a real claim upon their patriotism, interest, and support. For if local art, which was undoubtedly an industry as well, was not to be supported, whatever manner of good did the citizens expect to reap from an expenditure of something like 22,000*l.* on the mere extension of their school of art, and thousands more yearly upon its staff and maintenance, if they were going to allow their living artists and sculptors to starve? Why, in the name of common sense, go to the useless expenditure of educating more for such an unhappy fate? An architect told him the other day that he paid an educated sculptor capable of designing and executing figure subjects and artistic ornaments a considerably smaller wage than an ordinary trade-unionist mason.

The experience that has been already obtained in their own city, and the results seen by some members of the City Council of Birmingham on their recent visit to Berlin, have convinced the municipal authorities of the wisdom of their Gas Department in adopting the system of high-pressure gas supply both for public lighting and for private requirements. The City Fathers were particularly struck by the lighting of Berlin, where already the municipality have 25 miles of streets lighted with high-pressure gas. The Berlin authorities have, indeed, for the last two years been installing the latest patterns of high-pressure gas lamps with inverted burners in lieu of the existing gas and electric lamps. The change is being effected in execution of a scheme which involves the expenditure of 350,000*l.* at the rate of 50,000*l.* a year for seven years. The lamps used are graded according to the importance of the thoroughfare. At junctions of main streets lamps of 4,000 candle power are erected, lamps of 2,000 candle power illuminate main thoroughfares, and in other streets lamps of 1,000 and 600 candle power are used.

As compared with the ordinary system of gas supply, it may be mentioned that, ordinarily, the pressure of the gas produced for lighting and heating is at a maximum of three or four inches water pressure. It is forced into the mains through the governors and distributed through the district of supply by the weight of the gasholders. High-pressure gas differs only from the ordinary low-pressure product in that it is taken from the outlet pipe of the gasholder and passed through a compressor, by means of which it can be raised to any pressure desired. Under the Birmingham scheme it is not intended at present to raise the pressure at the works beyond 5 lb. or 6 lb. per square inch, or about 120 or 140 inches water pressure. For lighting purposes this pressure will be reduced to about 60 inches, and there will be reductions to other pressures according to the requirements of consumers. Having regard to the reinforcement of the ordinary supply to outlying districts, and the connection of branch pipes with the trunk high-pressure main for this purpose, governors will be placed at the district junctions in order to reduce the pressure to the normal. One special feature of the installation is that much smaller mains are required for the high-pressure system than for the distribution of the low-pressure gas. For factory purposes, especially in such trades as are particularly represented in Birmingham, high-pressure gas has many advantages.

In his valedictory address Mr. C. F. Beckett, President of the Architectural Association of Ireland, administered what is likely to be the *coup de grâce* to the suggested scheme for amalgamating the Association with the Royal Institute of Architects of Ireland, a scheme not too well considered in detail, by which the Institute would swallow up the Association and incidentally raise the subscription of its own members.

## MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

### XI.—METHODS OF COOLING (*continued*).

### *Cold Air Blast.*

Cooling on this system is also effected mostly by direct expansion of the gas; but instead of the pipes where the expansion takes place being fixed round the walls and on the ceilings of the rooms themselves, they are built into stacks in a separate insulated chamber. Sometimes brine is circulated through the pipes, and we have then a modification of system 1, although it is preferable to have direct expansion if possible. The same arguments apply in comparing the two as were used when discussing system 1 and system 2. That is to say, on the side of direct expansion we have the low first cost and a smaller coal bill, and on the side of brine we have storage of "cold" and even temperatures.

The cooling apparatus in the separate chamber is known as the "air cooler," of which many different forms have been devised, and these may be divided into two classes—first, wet air coolers, and second, dry air coolers. In the latter, the pipes are either built into stacks by themselves, or immersed in a bath of still brine; in the former, they stand in a shallow receiving tank, and from that tank a pump is continually elevating the brine to a split distributing pipe above the coils, whence it falls over the pipe surface to the bottom. Modifications of both these systems are found, but it is common to all to have a powerful fan, by means of which hot air is sucked from the cold rooms, and returned to them when it has been chilled.

Wet air coolers have been used by Messrs. Haslam for many years, and have formed the subject of letters patent. Their system involves connecting up the compressor and condenser to an evaporator or large brine tank containing the evaporating coils. A circulating pump is provided, and the cold brine is circulated to and from the air cooler chamber, which is quite separate from the cold rooms. Inside the chamber are located corrugated galvanised iron sheets, surmounted at the top by a storage tank, from which cold brine continuously trickles over the sheets. Being broken up in its passage, it offers a large cooling surface to the air, and at the same time adds to this surface by chilling the metal sheets themselves. The air is therefore cooled quite rapidly.

Another apparatus frequently used for wet air cooling is a "rotary cooler"; this consists of many discs mounted on a slowly revolving shaft, which is supported on a tank half filled with brine, and containing the evaporator coils. Air is circulated through the apparatus in the usual way by means of a fan, and, coming in contact with the wetted discs, has its temperature quickly reduced, owing to the large surface available. In Messrs. Borsig's design the evaporator coils are also placed at the bottom of the cooler, and immersed in brine, but the extended cooling surface, instead of being provided by wetted discs, is attained by allowing the brine to trickle continuously from the top over shelves.

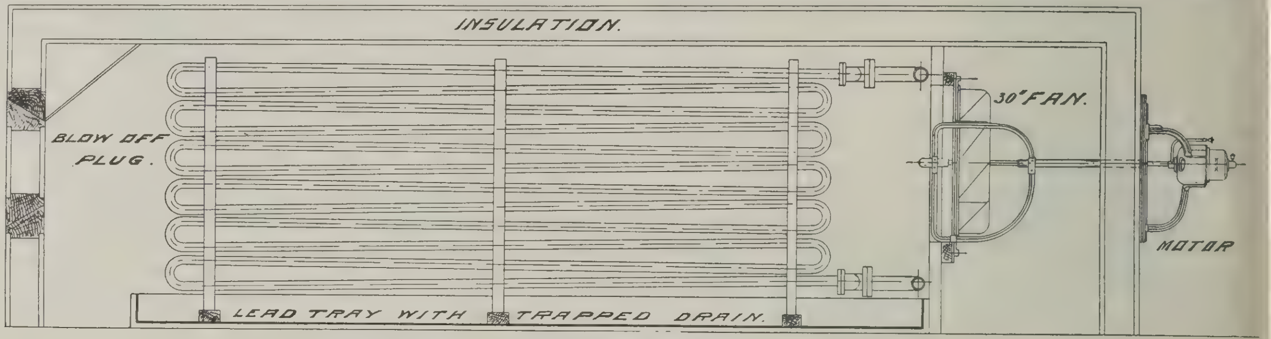
Messrs. Douglas have adopted a wet air cooler which does not necessitate an evaporator; the compressor and condenser are connected up directly to stacks of coils in the air-cooling chamber, and over these the slightly warmed air from the cold rooms is blown in the usual way. The coils stand in a shallow tank, and above them is fixed a distributing trough or split pipe, according to the size of the cooler. Brine is raised from the tank by a small circulating pump to the distributing apparatus, and is then allowed to trickle over the pipes, inside which the refrigerant is being vaporised. In this way it becomes thoroughly chilled, and offers the required surface to the air which is to be cooled. The advantage of the arrangement is that it is to all intents and purposes direct expansion, as the vaporising gas extracts its latent heat immediately from the air itself, the cooling surface being increased by the trickling brine. Higher working economy is accordingly obtained, as before demonstrated, and a simpler plant.

The object in installing a wet air cooler is to obtain a very low temperature, and at the same time to retain the advantages of the separate cooling chamber and cold air circulation. The air blast, in the ordinary way, is not adapted for exceptionally low temperatures, but, with the very much larger surface afforded by the addition of trickling brine, and the rapid cooling obtained, it is found to be quite as efficient as piping the room itself. Each of the wet coolers described is found to give every satisfaction in practice, but the last named is by far the least expensive to instal, as the evaporator is entirely eliminated, and the arrangement is so extremely simple. It is also rather more economical in working, owing to the higher back-pressure allowed by direct expansion.

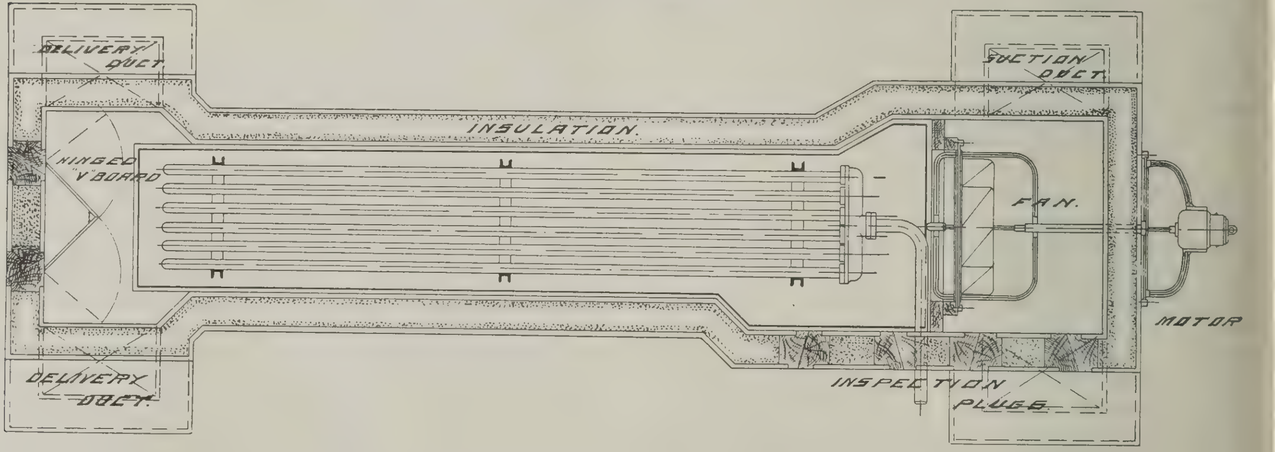
Fig. 33 shows a cooler on the dry air system. It is advisable to employ this arrangement wherever possible in preference to the wet coolers, as, with the latter, specks of brine are frequently carried out by the blast into the cold rooms, and deposited on the goods which are being stored, with bad effect. Only when very low temperatures, and at the same time air circulation are required, should a wet cooler be used.

Referring to the figure, it will be seen that the pipes are in six sections, supported by channel irons, which rest on hardwood blocks. The sections are connected at their terminals by cast-iron headers or "manifolds," by means of which the gas or the brine is evenly distributed and collected. In this case brine is used, but for directly expanding gas the design would be precisely similar, except that the length of piping for the same storage capacity would be only about two-thirds of that shown in the drawing. The air-circulating fan, 30 inches in diameter, is seen at one extremity of the cooler; it is directly coupled to a motor of about one-horse power, which is supported on the outside of the chamber, and controlled from the engine room in another part of the building. The spindle connecting the two is carried right through the insulation.

Close to the fan are the terminals of the two main suction ducts, each 24 inches by 16 inches, giving a combined cross-sectional area for the two, which is rather more than equal to that of the fan. These ducts are led one to each of the two large rooms which are served by this cooler, and are carried along the roof in the corner. At intervals in their length regulating slides are inserted, by means of which air is sucked from all parts of the rooms, and the cross section of the ducts is diminished by suitably tapering them at such a rate that the suction area, counting the slides, is always approximately constant. The two delivery ducts are located at the opposite end of the cooler, and are each of the same area as the suction passages. They are also led away, one to each room, but, instead of being carried in the upper part, should always run along the floor, where space permits. The remarks as to adjusting cross-sectional areas and supplying regulating slides apply to the delivery ducts equally with the suction.



ELEVATION.



PLAN.

FIG. 33.—DRY-AIR COOLER.

It will be noticed that, at the suction end, two inspection plugs are fitted, and that a blow-off plug is fixed near the delivery. The purpose of the former is to provide ready access to the fan and to the headers respectively, and the latter is used for "defrosting." This operation becomes necessary when the plant is started after a long interval of rest, and also, occasionally, when it is running. It consists simply in thawing out the snow which accumulates on the pipes, due to the condensation and freezing of the air moisture, and is accomplished by sucking in warm air from the atmosphere through an inspection plug, and discharging it by the blow off. Th snow then melts and trickles down to the lead tray beneat the coils, whence, by a trapped pipe, it is led away to th nearest drain.

The insulation of this chamber should be carried out wit the same thoroughness as that of the rooms. No pains shoul be spared, as it is here, if anywhere, that leakage would tak place, owing to the very low temperature. The ducts shoul also be insulated if there is space intervening between th cooler and the cold stores, but if, as in this case, the cooler i built actually on the roof of the stores, the necessity does no arise.

To show how the air is distributed to the rooms and col lected again, we reproduce in fig. 34 a plan of a fair-size Irish butter store. There are five rooms with a total storag capacity of 52,300 feet, and all are served by a common ai cooler, built on the cold dry air system. It may be noted, b the way, that the span roof is supported on cast-iron columns and that these, where they come inside the rooms, had to b carefully insulated to prevent leakage of heat.

From the cooler suction and delivery ducts are carried t each of the five rooms, and the air is passed in and out of the by suitable slides. The ducts, as will be observed, are tapere to keep the suction cross section constant, and the area of each duct, except in the case of the largest room, where there are brine pipes in the roof, is to be proportional to the capacity of the room, or rooms, which it serves. That is to say, it is proportional, if the temperature is to be the same all over. If the temperature in different rooms varies, then the duct area must be increased for those where it is lowest.

The exact amount of the increase could be calculated, but is more safely taken from experience. For instance, it is found that to maintain a given room having the same insulation efficiency, and having the same amount of goods brought in daily, at 24° Fahr., the refrigerating tonnage taken would be practically double that required for a similar room storing goods at 35°.

The large increase is due to three causes:—Lower suction pressure (hence less weight of gas passing), higher radiation losses, due to greater temperature difference (these might be eliminated by increasing the thickness of insulation in proportion), and the fact that the moisture in the goods, being frozen at the lower temperature, requires the extraction of latent heat. Consequently a room of 5,000 cubic feet maintained at 24° Fahr. would require a duct twice as big as one of the same capacity maintained at 35°. At other temperatures there is a different ratio, which can be determined from published tables, and which will be investigated in these articles at a later stage.

It may be well at this point to show briefly how duct areas are calculated. As a numerical example, let us take the stores in fig. 34, and let it be assumed that there are no brine pipes to help the cold air in room No. 1, also that the temperature in rooms 1, 4, and 5 is to be 35°, and 24° in rooms 2 and 3. We have three ducts; the first serves room No. 1 at 35°, the second rooms Nos. 4 and 5 at 35°, and the third rooms 2 and 3 at 24°. Our fan is 48 inches in diameter, and this gives us a cross-sectional area of 1,809 square inches. Now 24,500 cubic feet are served by the first duct, 8,600 by the second, and 19,200 by the third. But the third carries air to a room maintained at 24°, and must, accordingly, be doubled in importance. This is equivalent to saying that it serves 38,400 cubic feet at 35°, which puts the third duct on an equal basis for comparison. Their areas, we now see, must be in the proportions 245, 86, 384, and combined they should theoretically come to 1,809 square inches. Actually, however, we shall add 25 per cent. to this, as the friction in small passages is so much greater, and this gives us, for the total area, 2261 square inches. Dividing this up in the specified proportions, we find that the first duct should have an area of 775 square inches, the second 272, and the third 1,214. Convenient sizes to give these areas would be 23 inches by 34 inches, $13\frac{1}{2}$ inches by 20 inches, and 28 inches by 43 inches, and the ducts would then be made to these measurements between the cooler and the rooms, tapering down gradually, after their entry into a room, as the distance from the cooler increases.

The calculations for the amount of taper given to that part of a duct which is in the room, and the size of the slides, are very similar. Referring again to our numerical example, let us take duct No. 1, serving room No. 1 on plan, the length of which is 112 feet. It will be supposed that slides are placed every 7 feet, which gives us, counting the first and last, seventeen openings. The area of the duct is 775 square inches, hence each of the slides should be, theoretically, 46 square inches, but, as some of the slides will be partially closed when working, it is wise to make another increase of 25 per cent. This gives us an area of 58 square inches, which will be approximately obtained by making the slides 10 inches by 6 inches. The taper of the duct is very simply found; at its entry to the room its area is 775 square inches, and at the other end at least $\frac{1}{17}$th of this, or 46 square inches, giving a cross section of say 10 inches by 6 inches, the 10 inches being vertical. The size of the duct at entry is 34 inches by 23 inches, and, consequently, the diminution in the vertical dimension is 24 inches, in the horizontal 17 inches. This is equivalent to a taper of 1 in 56 vertically, and 1 in 79 horizontally.

Owing to the friction the blast will be more powerful at those slides which are nearest to the fan, and usually, in practice, these will be kept partially closed, to reduce the draught to a more even value. Friction, indeed, plays a very important part in the design of trunking and ducts. To avoid it, all the passages should be of ample area, there should be no constrictions, no sharp edges or bends, and the cross section should be nearly square. This shape, next to the circle, gives the least friction surface per unit of area. Unfortunately, however, it is not always practicable, owing to the obstruction of the hanging space which would be caused, and the dimensions of the ducts are more commonly arranged in the ratio of 2 to 3.

Turning once more to fig. 34, it will be observed that the shape of the insulated space, as viewed in plan, is very unlike a square. The reason for this is the disposition of the build-

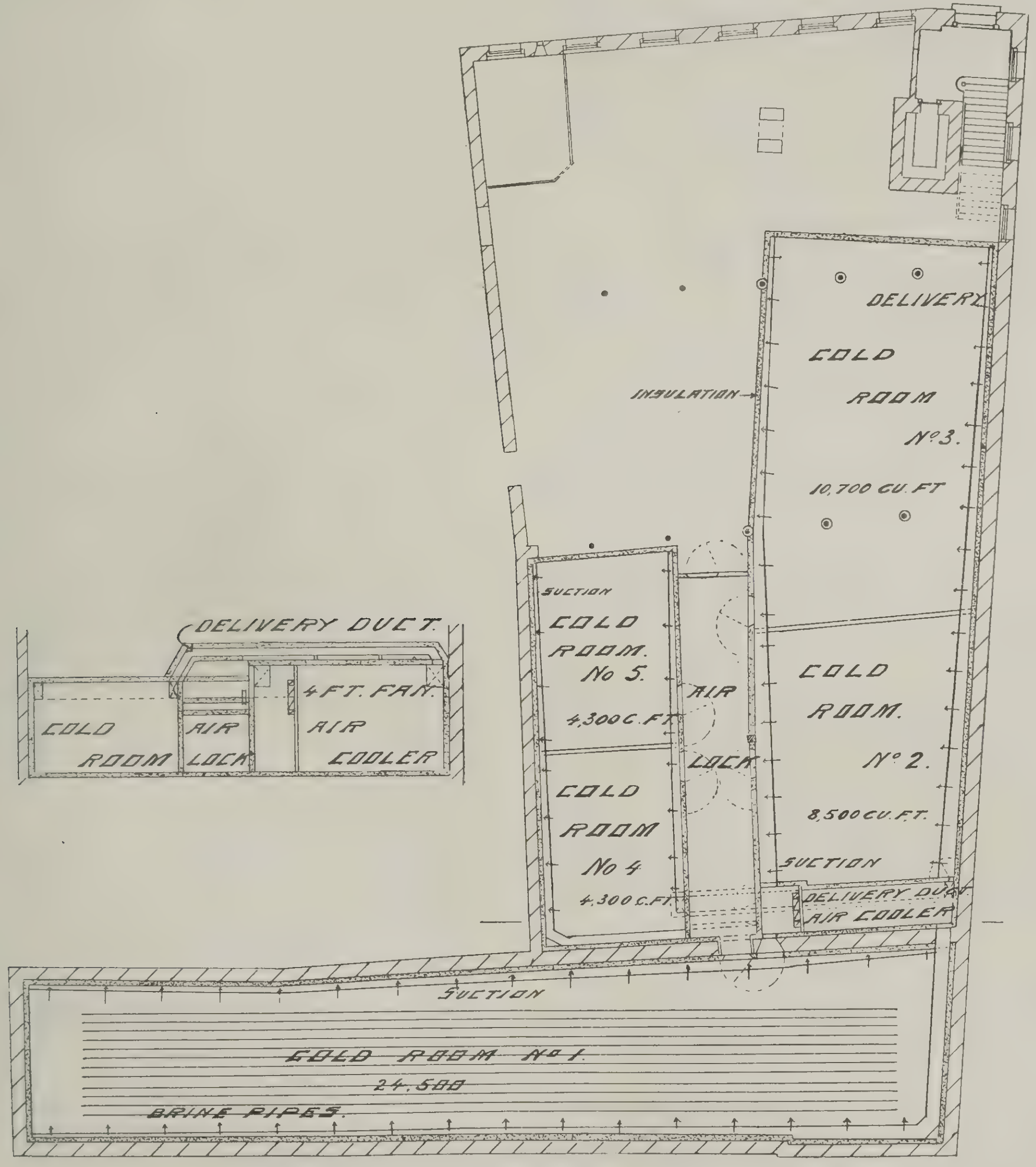


Fig. 34.—BUTTER STORAGE ROOMS COOLED BY COLD-AIR BLAST.

ings, which were in existence before the cold stores were contemplated. Otherwise, such a bad design would certainly not have been adopted. Room No. 1 is particularly awkward, as not only is the ratio of radiating surface to volume excessive, but cooling is rendered extremely difficult by the long and narrow shape.

The air cooler, which is on the roof of the stores, is very similar to that shown in fig. 33, and is also on the brine circulation principle, being connected to the evaporator of the refrigerating machine, and to the brine circulating pump. These and the rest of the machinery are located in a separate engine room.

The type of air cooler which we have been discussing is the best possible for large stores, and if on the direct expansion principle, is comparatively inexpensive to instal, and also fairly economical in working. But, when we come down to small single rooms up to 2,000 cubic feet capacity, it is inadvisable and sometimes impossible to put in a separate chamber for the cooling coils. In such a case, it is quite sufficient to partition off the cooler from the rest of the room by a diaphragm of wood. Air is sucked in by a fan through a hole in the top of the diaphragm, and, after passing through the cooler, is discharged cold by suitable apertures in the bottom. Trunking, where the room is long and narrow, or otherwise awkwardly shaped, is led from the apertures, and delivers the cold air to goods in all parts of the store.

Frequently with these small plants the machine can be run only for a certain number of hours in the day. It then becomes necessary to have not only extra thick insulation, but also some means of storing up "cold" when the compressor is shut down. This is best attained by partially immersing the air-cooler coils in a bath of cold brine, which, being heavy, and having a high specific heat, offers the required storing capacity. No objections can be raised to the brine tank, such as were brought up in connection with the wet air cooler, as the brine, not being sprayed, is never carried over into the chamber with the air. It is even an advantage, as the calcium chloride solution being hygroscopic has a beneficial drying action on the air, beyond that which is exerted on it by the quick chilling.

This property of calcium chloride has been utilised by Mr. Madison Cooper, U.S.A., in his cooling system for egg stores. The air in these stores must be of a certain exact degree of humidity, and must also, in common with the air in any store, be exceedingly pure. To attain the latter object, Mr. Cooper passes the air through a small tower before it reaches the air cooler. From the top of this tower, water or brine is trickling continuously in a fine spray. The air ascending is closely intermingled with it, becomes washed, and also to a certain extent cooled. Refrigerated brine must be used, unless the air is freshly taken in from outside. It then passes through the cooler which is connected to the freezing machine, and finally through another tower, in which is located a quantity of calcium chloride, or other hygroscopic agent (such as concentrated oil of vitriol—sulphuric acid). There the absorption of moisture is regulated by dampers, or other means, and the humidity of the air can be adjusted to a nicety.

## RENAISSANCE MONUMENTS IN THE ROMAN CHURCHES, AND THEIR AUTHORS.*

(*Concluded from last week.*)

FROM St. Marco we pass to the ancient basilica St. Clemente, and, having in mind the characteristics exhibited by Dalmata in the crypt, we examine the tomb of Cardinal Roverella in the choir to the right of the high altar. The cardinal died in 1476, just about the time when the tomb of Paul II. was completed, if Vasari is right in assigning two years for its execution. Here again two artists have been at work, one of them undoubtedly Dalmata, but his collaborator is not either of the Minos. He is probably a sculptor who elsewhere worked with Mino da Fiesole, or called in Mino to assist him, one Andrea Bregno, to whom I shall come by and by. His share in this monument consists of the fine recumbent portrait figure, the Apostles, and the little angels at the base. The rest of the monument—the Madonna and attendant angels, the dignified figure of the Father, and the angels at the ends of the sarcophagus holding back the curtains, a Renaissance adaptation of an old Gothic motive—can be assigned to no other hand but Dalmata's. A Pieta, evidently his also, a fragment from some monument now broken up, may be seen in the porch of the church of St Agostino. Herr von Tschudi has pointed out his marked manner in certain portions of the Tebaldi monument in th church of the Minerva. This prelate died in 1466. It doe not follow that the tomb was constructed immediately afte his death. We may, however, assume that Dalmata worked in Rome for about fifteen years. Of his subsequent career some records have been discovered by Fabriczy and others He was summoned to the court of Matthæus Corvinus, King of Hungary, who ennobled him and gave him a castle in Slavonia. His work may be traced in Venice and Vienna and finally in Ancona, where the tomb of the beatified Girolamo Gianelli, a work of his later and failing years, was executed as late as 1509.

And now to return for a moment to Mino da Fiesole Another important work which must have been put in hand about the same time as the tomb of Paul II. is that of Cardinal Forteguerra in Sta. Cecilia. The fragments of this monument, which had been broken up, were only put together again in 1891, and it has suffered from injudicious regilding. The Madonna and Child is his work, as also is the recumbent figure of the fighting cardinal, which is treated in the same manner as his presentation of the Count Ugo in the Badia at Florence. It does not lie on the sarcophagus, but on a sort of shell or bier raised above it. The other figures were probably contributed by Andrea Bregno, the angels in the lunette being characteristic of his manner. In the sacristy of this church there is also a Madonna from Mino's workshop.

A year before Cardinal Forteguerra, died Pietro Riario, Cardinal of San Sisto, the favourite nephew who was called by Sixtus IV. from a Franciscan monastery to become a prince of the church, and who, after a meteoric career of wild excesses, died only two years after his elevation. His monument, one of the most interesting in Rome, is in the Church of the Holy Apostles. The relief of the Madonna and Child appears to be the work of Mino in one of his happiest moods. The saints in the upper niches of the pilasters are also his. One, at any rate, of the lower ones I should attribute to another hand, and the groups on either side of the Madonna have been, I think, with justice given to Andrea Bregno. So, also, the sarcophagus and the recumbent figure have hitherto been. With this attribution, however, I venture to differ. The portrait figure is treated in the same manner as in the Forteguerra monument. The face is strong, highly finished, and polished like ivory. The sarcophagus is the most beautiful example of such work in Rome. The heads of the sphinxes are reminiscent of those on the Tuornabuoni monument in the Minerva. The little putti between the garlands are masterpieces of decorative workmanship. It was copied some twenty years later for the grave of Cardinal Savelli in the Aracœli Church, which comes no doubt from Andrea Bregno's workshop. There was evidently here no question of casting and accurate reproduction. It is a mere copy, with all the essential differences of the two manners. The one is individual and full of charm, the other characterless and mechanical.

And now we have to consider the problem of an artist whose individuality has only recently been disengaged and re-established, though he worked for at least forty years in Rome and perhaps much longer. The name of Master Andrea appears first, chronologically speaking, in an inscription on the old high altar of Sta. Maria del Popolo, erected by Cardinal Roderigo Borgia (Alexander VI.) in 1473, and now preserved in the sacristy. The inscription states that while Andrea was at work on it, fate cut the thread of life of his beloved Marcantonio at the age of seven, owing to the carelessness of his attendants. The boy had probably climbed the scaffolding to see his father's work, and fell from the top, therefore the inscription on the altar. It is clear that the sculptor of this altar was also the author of two tabernacles in the first chapel to the left of the door, and it is also clear, though I cannot here explain all the chain of proof, that he is identical with the Andrea Mediolanensis, of Milan, who inscribed his name on the great Piccolomini altar in the cathedral at Siena. Now with regard to this altar we have a letter from the illustrious Platina to Lorenzo di Medici, recommending to him one Andrea, an eminent sculptor, his neighbour in Rome and intimate friend, who wished to bring marble through Tuscan territory from Liguria for an altar on account of Cardinal Piccolomini. In a contract which Piccolomini made in 1501 with the great Michel Angelo for the completion of this altar with certain additional figures, Andrea is again referred to. Milanese, who edited this document, obscured his individuality by adding the name Fusina. The Lombard sculptor, Andrea Fusinæ, is, however, a very different person, and quite rudimentary powers of critical observation suffice to show that our Andrea has nothing to do with him. Once more our Andrea is mentioned in the rhyming chronicle of Giovanni Santi, Raphael's father, who speaks of "the eminent Andrea Verrocchio, and that other Andrea who at Rome is such a master of composition."

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* A paper by the Right Hon. Sir Rennell Rodd, G.C.V.O., K.C.M.G., P.C., His Majesty's Ambassador to the Court of Italy, read before the Royal Institution of Great Britain on June 3.

Who, then, was this master who stood so high in the esteem of contemporaries? The clue is afforded by a monument, long lost sight of in a corridor leading from the church of the Minerva, which is now incorporated in the Ministry of Public Instruction. The inscription tells us that it was erected to the memory of Andrea Bregno, of Osteno, in the territory of Como, a very celebrated sculptor, known to contemporaries by the name of Polycletus, who first restored to use and application the lost art of chiselling (*artem celandi*) as practised by the ancients. He lived eighty-five years. It was erected in 1506 by Bartolomeo Bolli, controller of the Papal records, and Catherine, his wife, Bregno's wife, that is; for another document discovered by Bertolotti shows that Andrea di Brignonibus, a sculptor of the diocese of Milan, who lived in the Rione Trevi, made a testamentary disposition on July 8, 1503, of a part of his house to his wife, Catherine. This will thus refers to him as of Milan, though he was born at Como, where the Bregno family produced at least four members who became eminent in the story of art. Round the circular niche, containing the bust, and in the pilasters are shown all the tools and implements of his craft. The words "*artem celandi*," the art of chasing or chiselling, which he is said to have revived, have, I believe, a special meaning, and the phrase is not merely complimentary. A strict Latinist would maintain that *celare* should signify the chasing of metals, but we find in the Latinity of this period such phrases as *celatorius marmorum*. I have found no record in any of the Papal registers of Andrea Bregno as a goldsmith, and had he revived any lost art in working precious metals, he could hardly have failed to receive commissions from Paul II. or Sixtus IV. He is only referred to as *sculptor marmorarius* or *statuarius celeberrimus*, and I believe the meaning to be that he was the first in Rome to reintroduce the art of decorative marble-cutting on incised surfaces, after the manner of the ancients. A study of his works shows that he was indeed the chief initiator in Rome of Renaissance surface decoration, ornamenting pilaster and frame with delicate candelabra and foliage and armorial design—and I believe it can fairly be established that it was after his acquaintance with and association with the Roman Andrea that Mino da Fiesole applied such elaboration of ornament to his own monumental work.

Andrea was born about 1421, and we have no evidence as to how the first forty years of his life were spent. If I may hazard a conjecture, it would be that he worked with Paolo Romano and Isaiah. There is no time to examine the evidence in support of this theory. It must suffice to say that his first tombs follow the model established by the latter, and I should attribute to him the restorations to the tomb of Eugene IV., or shall we say, the portions which are evidently not by Isaiah himself? Andrea's angels have their prototype in those of Paolo Romano in the shrine of St. Andrew in the crypt, and a third lunette, differing in some respects from the other two, may be his work. In his native Osteno are two tabernacles closely resembling those of Sta. Maria del Popolo; they are dated 1464, and were probably executed in Rome. For his earlier work here we must go to San Pietro in Vincoli, where the monument of Cardinal de Cusa is no doubt rightly attributed to him, and to the church of Aracœli, where the grave of Cardinal d'Albret (Lebretto) demands particular attention. Lebretto died in 1465, and if this was one of the first independent commissions obtained by the Lombard artist, it might account for the exceptional care and finish bestowed on the figures, before great press of work compelled him to leave execution to pupils. The St. Peter and St. Paul, rendered on the lines laid rudely down by Paolo Romano, fixed the type ever afterwards followed in Rome. The reliefs in the niches are among the most beautiful works of the Renaissance in the city. The St. Michael is a little masterpiece, both of design and execution. The recumbent figure is evidently an excellent piece of portraiture. At present there is little ornamentation. Eight or ten years later Bregno had learned to cover base and pilaster and architrave with every elaboration of arabesque and floral design.

In the Salviati chapel of St. Gregorio there is an altar erected by an abbot of the church in 1469, the manner of which suggests Lombard traditions. It is now generally attributed to Bregno, and a comparison of its details with those of the great altar of the Madonna della Quercia at Viterbo, carried out by him some twenty years later, is, I think, convincing. Next in chronological order comes the altar of Sta. Maria del Popolo, executed for Roderigo Borgia in 1473, and about the same time are the tombs of Pietro Riario and of Cardinal Forteguerra, where I have little doubt Bregno was the artist who collaborated with Mino da Fiesole, as well as the Roverella grave in St. Clemente, where he worked in combination with Giovanni Dalmata. The scheme of the Lebretto grave was reproduced in that of Cardinal Alanus in S. Prassede in about 1475, but the two female saints in the pilaster niches seem to be by another sculptor, who is responsible for a good many of the figures in the Roman graves, but who remains for the present unidentified. Some of Bregno's best work in design and portraiture belongs to the years 1478-9. The fine tomb of Cardinal Cocca in the Minerva, and the beautiful monument of Cardinal Cristofero delle Rovere in Sta. Maria del Popolo, are of this period; the Madonna of the lunette in this last, however, once more by Mino da Fiesole. Some of the decorative work in this monument repeats motives found in the Piccolomini altar at Siena. The very dignified figure of the cardinal is a little soft for Mino, and is no doubt rightly attributed to Bregno, of whose manner the angels on either side of the Madonna are typical. This monument was so much admired that it was constantly reproduced. In one instance, in that of Cardinal Ferici, in the cloisters of the Minerva church, the Madonna also appears to be from a design by Mino. Other instances are the tombs of Cardinal Superanzi in the Minerva, of Cardinals Rocca, Pallavicini and Giustiniani in Sta. Maria del Popolo, and that of Cardinal Diego Valdez, who died in 1506, carried out in his lifetime, in Sta. Maria in Monserrato. All these copies are, with the exception of the first, very inferior in execution to the original. There are a great number of other monuments of this period of active production when the nepotism of the Popes filled Rome with wealthy and ambitious prelates, which are properly traceable to the workshop of Andrea Bregno. The latest, perhaps, in which his direct influence may be traced, is the Savelli grave in Aracœli, which cannot be dated before 1495, when Bregno was already a man of seventy-five. In design it is practically a remodelling of the Lebretto grave in the same church, with a lunette superadded above the architrave. The saints below the pilasters have their prototypes in those of the tabernacles of Sta. Maria del Popolo. The sarcophagus is a copy, vastly inferior in workmanship and delicacy to that of the Riario grave in the SS. Apostoli, which I have given my reasons for attributing rather to Mino da Fiesole's inventive genius than to Andrea. The Madonna and Child of the lunette belong to the type produced by Luigi Capponi of Milan, who, it would seem, succeeded to the direction of the great workshop.

From an inspection of the various monuments to which I have referred it is possible to derive some idea of Bregno's manner. His recumbent figures are finely executed, suggesting able portraiture, without the strength and delicacy of Mino's. He created the types of saints, in the subordinate parts of these Roman monuments, which were reproduced by numbers of contemporaries and successors, whose work it is not easy to differentiate from his own. They display much skill and facility without strong individuality of style or the impression of a dominant personality. They remind us rather of the art of the ivory carver, complete within its limitations. Above all, Bregno was a master of ornament, and if he lacks great originality he taught many others the rules and methods of a charming art of surface decoration.

The great activity which the nepotism of Sixtus IV. provided for the sculptor's bottega, which produced the monuments of the Riarios, the delle Roveres, and the Bassi, was continued through the pontificate of Innocent VIII., to which belong a whole series of kindred pieces. In this and the following reign, moreover, a French prelate, Guillaume de Périer, who became very wealthy as auditor of the Rota, erected a whole series of altar-pieces which bear the stamp of the same workshop. From the mass of craftsmen who must have been employed it is difficult to disengage distinct personalities. But I am inclined to think that students of the work of Cristofero Romano, the son of Isaiah of Pisa, in the Certosa at Pavia, will see in details of not a few of the Roman monuments evidence of a similar hand, and it is legitimate to assume that before going north, in or about 1491, he was one of the numerous band of assistants of Bregno. The name of Jacopo di Andrea of Florence is also preserved to us in a record as the author of the beautiful tomb of Marc Antonio Albertoni in Sta. Maria del Popolo. This is one of the first instances of a somewhat different type of smaller monument which came into use towards the end of the fifteenth century (1489), and it seems probable that this Jacopo of Florence was, as his appellation suggests, a pupil of Andrea Bregno.

There is, however, an artist of considerable merit and achievement whom we are able to identify, thanks to the preservation of two contracts, and with a brief notice of his work I will conclude. The restoration of Luigi Capponi to his place in the history of art was first due to the critical investigations of Conti Gnoli. But I do not think the full catalogue of his work in Rome has yet been compiled.

The first of these documents is a contract of the year 1485, made with Luigi Capponi of Milan and Giacomo di Domenico della Pietra, for a marble tomb to be made for Brusati, Archbishop of Nicosia, nephew of Cardinal Roverella, by the side of whose tomb it stands in San Clemente. It was to be completed in four months at a cost of 60 ducats. It resembles the monument of Cristofero delle Rovere on a smaller scale. Certain characteristics of the ornamentation, such as the candelabra of the pilasters, the tazzas, and the little flaming lamps, the strings of beads festooned or dependent should be noted. These are a sort of hall mark of Capponi. The drapery is academic, the folds are deeply and straightly chiselled, and there is a geometrical correspondence of angles in the sleeves. The second document which has come to light is a contract between a certain Michele Buttaroni and Master Luigi, this time alone, for a marble Crucifixion to be made for the church of Sta. Maria delle Grazie. The relief to be enclosed in a frame for an altar. The Crucifixion has now been moved to a ward in the hospital of the Consolazione behind the church, and is therefore difficult of access; the frame is still in the sacristy. The reliefs on the pilasters are almost identical with those of the Brusati tomb. Over the pediment are the arms of Innocent VIII. In this contract no mention is made of Giacomo di Domenico, who we may assume was only the marble mason. The figure on the cross in the relief is rather inanimate; on the other hand, the figures of the Virgin and St. John on either side are full of expression; the sense of grief in the faces is powerfully rendered, and all the workmanship is good down to the minutest details, the hands especially being rendered with delicate care in execution. The St. John is tolerably well represented, though much less fine in execution, in another relief representing Pope Leo I. kneeling in adoration before the Evangelist, and which may be seen in the baptistery of St. John Lateran. The figure of the St. John is here turned to the left instead of to the right, as in the Crucifixion, but the whole manner of treating the drapery, and the characteristic corded long hair flowing down over the neck, leave no doubt as to the identity of authorship. You should also notice the flaming lamp suspended from a nail, holding up festooned garlands, for this also we shall find elsewhere. Now observe the kneeling pope, whose name is inscribed near the feet. The drapery here is treated in quite a different fashion, is undulatory, and natural rather than academic. Characteristic is the facial angle, and the great length from the point of the nose to the chin. Having these points in mind, we go to the church of San Gregorio, and find in a chapel of the transept an altar with a marble front divided into three compartments, illustrating the miracles of St. Gregory. In the compartment on the left, Pope Leo of the Lateran reappears as St. Gregory, and we find throughout all the profile faces of the three reliefs the same curious facial angle and disproportion between the upper and lower portions of the face. The St. Sebastian of this compartment and the San Rocco of the corresponding are very near relations of the St. John of the Lateran relief. There are several other points of analogy, notably the strings of beads which appear on the pilasters attached to the flaming lamps like those of the Lateran relief and the Brusati tomb. They reappear in festoons on the architrave. Under one of the pilasters are the initials M.B. inserted in a kind of cabalistic emblem, under another a wheel with rays, and under a third the Florentine lily.

An explanation of these emblems is afforded by a monument now in the courtyard in front of the church, to which it was removed from the chapel when the church was redecorated. This monument reproduces nearly all the characteristic features of Capponi's work which have been noticed. In it we find again the Florentine lily, the eight-rayed wheel, the armorial bearings of the Bonsi family, and the inscription tells us how Michele Bonsi initiated the idea of erecting the monument in his lifetime, and his brother Antonio, though the elder of the two, afterwards joined in the scheme. From the archives of the Bonsi family in Florence we learn that they erected a chapel in San Gregorio in 1470. Antonio was sent as orator of the republic to Rome in 1498. He was apparently a merchant of brocades, as large purchases of materials from Antonio Bonsi & Co. figure in the coronation accounts of Pius III. Michele had been established already earlier as a banker and agent in Rome. In this monument the recumbent figure is replaced by two portrait busts, inserted in circular niches. It appears to be the first example in Rome of a manner frequently adopted afterwards, which Luigi Capponi no doubt introduced from Lombardy, where we are familiar with it in the Certosa of Pavia and elsewhere. It is repeated in the tomb of the brothers Antonio and Pietro Pollaiuolo, in San Pietro in Vinculi, which I also attribute to Capponi, as, I think, we may also do the monument of Andrea Bregno.

Having fixed certain mannerisms of style, and certain specific characteristics of Capponi's treatment of decorative work peculiar to himself, wherever we find these repeated in other examples during the last twenty years or so of the fifteenth century we may safely assign them to his workshop. Thus there are several ciboria, or tabernacles for holy oil, which may be catalogued under his name. One of these is in the hospital, close to his remarkable relief of the Crucifixion. The most interesting and elaborate of them is in the church of the Quattro Coronati. All his own peculiar paraphernalia of ornament are found here: the hanging lamps, the cornucopia of the Bonsi tomb, the candelabra and the strings of beads. The angels resemble those of the tomb, and the chiselling of the wings shows the identity of workmanship in both. A Virgin and Child over the door of the hospital of the Consolazione, where there is so much of his work, resembles that of the Bonsi tomb so closely that it must also be assigned to him, and from these two Madonnas we are able to identify others in other monuments of Rome, of which, however, it would be unprofitable to trouble you with a list. There is, however, one important attribution which I have been enabled to make, and which is, I believe, entirely new. In the crypt of St. Peter's are many fragments of a tabernacle made in the reign of Innocent VIII. to contain the relic of the Holy Lance. The three sides represent doors guarded by angels. The figure of the Saviour over the central doors reveals the same hand as the crucified figure in the hospital relief, and the angels, though executed by different marble cutters, are all designed by the artist of the ciborium.

In the brief time available it has only been possible to deal with a small proportion of the great quantity of sculpture produced in Rome during the second half of the fifteenth century. If it was not all of the highest quality, it has at any rate the interest of remarkable decorative workmanship, and includes a great number of first-rate portraits. With the close of the century the sense of restraint gave way to extravagance and over-elaboration, and the devotional and reverential quality disappeared. I should like, in conclusion, to show you one last example, which has a particular interest for Englishmen, because it is the monument of Cardinal Bainbridge, Archbishop of York: a most truculent and quarrelsome prelate, whose ungovernable temper brought him to an untimely end, being poisoned by a servant he had castigated. An unknown artist has, however, made his effigy immortal in the little church of the English college, where he lies an embodiment of saintly repose.

# ILLUSTRATIONS.

### HOUSE AT KILMAURS, N.B.

THE house was designed by Mr. JAS. B. FULTON, A.R.I.B.A., to meet special requirements. The walls are brick with rough-cast and red stone dressings. The tiles are Messrs. S. & E. COLLIER'S, LTD., Reading. The builder is Mr. HUGH JOHNSTON, Irvine.

### TWO DRAWINGS BY MR. G. E. KRUGER.

THESE two pencil-portrait studies or sketches by Mr. GEORGE E. KRUGER were exhibited last year at the New Gallery.

### OXFORD COLLEGE SERIES, ALL SOULS.—CHAPEL—LIBRARY.

WE this week continue our series of views of All Souls College, which we shall complete next week.

A SOUTHERN district meeting of the Institution of Municipal Engineers will be held at the committee room, Royal Pavilion, Brighton, to-morrow, the 18th inst. The following papers will be presented for discussion:—"Some Aspects of the Housing and Town Planning Act, 1909," by Mr. T. C. Barralet, surveyor to the Godstone R.D.C. (member), and "Notes on the Use of Concrete," by Mr. Spencer Sills, assistant city surveyor, Rochester (member). The adjournment for lunch will take place at 1.30, and after lunch specially conducted visits will be paid to the Corporation destructor works and the Falmer waterworks, by permission of Mr. H. Tillstone, the borough surveyor, and Mr. J. Johnston, M.Inst.C.E., the borough waterworks engineer.

## ZINC OXIDE.*

(*Concluded from last week.*)

THE following discussion took place after the reading of Mr. Gaston Depièrres's paper on the above subject before the Paint and Varnish Society on May 12 (Mr. Cruickshank Smith in the chair), a report of which appeared in *The Architect* on May 28 and June 3 and 10:—

The Chairman: There is probably no pigment at the present time which is engaging more attention not only in the paint trade but also among the general public than oxide of zinc. The public are, I take it, becoming gradually educated or trained to look on white lead as a material which, whatever its good properties may be, undoubtedly possesses some disadvantages, and the tendency to use substitutes for white lead has recently been growing very fast. I am quite certain that, having heard the practical and suggestive paper which Mr. Depièrres has delivered to-night, we all appreciate that our knowledge of the fundamental technology of oxide of zinc has been increased to some extent, and it now remains for us to endeavour to carry to some practical conclusion the interesting information he has given us, and to endeavour by means of our discussion here to-night to elucidate some of the difficulties and problems which confront this subject. Perhaps it might simplify matters if we were to consider Mr. Depièrres's paper in two parts. He gave us first of all a very practical and apparently up-to-date description of the metallurgy of the manufacture of oxide of zinc. I have no doubt there are some gentlemen here to-night who can discuss this part from a practical standpoint. To many of us, however, the more interesting portion of the lecture was that devoted to a discussion of the uses of oxide of zinc, and I think the noteworthy points that Mr. Depièrres made were his evident preference for oxide of zinc manufactured by the "direct" process as against oxide of zinc made by the older, or "indirect," process, and his reasons for this preference. That Mr. Depièrres, who has studied this matter very thoroughly, and who has the advantage of possessing practical knowledge as a paint manufacturer of oxide of zinc paints in all their forms, can express an opinion so unreservedly, appears to me to indicate a very important epoch in the history of oxide of zinc, because, some years ago, when oxide of zinc came to be largely used by paint manufacturers, one can remember very well that the direct oxide of zinc of that time was looked upon as rather an unsatisfactory substitute for the material made by the indirect process. Mr. Depièrres now states, however, that direct oxide of zinc not only equals the indirect oxide, but, in many points, surpasses it in value as a paint material.

There are one or two points which I should like to ask Mr. Depièrres. With regard to the covering power tests, may I ask Mr. Depièrres to explain to us in what manner these tests were conducted. Can he tell us if the same weight of pigment has been applied on equal areas in the different tests, or has he simply shown us results of different paints after they have been mixed for use? The difference is rather important.

I do not know whether anyone who will speak later on will discuss the question of the combination of oxide of zinc with linseed oil. This is a point which is exceedingly interesting, and the opinion which Mr. Depièrres quoted as to the combination of oxide of zinc with linseed oil at ordinary temperatures is to many people somewhat startling. That it can be alleged as a fact capable of experimental proof that oxide of zinc actually combines with linseed oil in the cold is a matter which one would like to hear more about.

The question of the specific gravity of different grades of oxide of zinc is an interesting one, as also is the relation between the specific gravity of different grades of oxide of zinc and the oil absorbed in the grinding of the oxides into paint. I do not know whether Mr. Depièrres can give us any figures which will indicate the variation of specific gravity in different receptacles of the depositing chambers of an oxide of zinc plant. Can he tell us the specific gravity from the highest to the lowest grade, and the proportion of oil that the various grades will absorb in grinding?

With regard to the latter part of the paper, in which the lecturer dealt with the probable formation of oxychlorides in the presence of salt water, that appears to be a somewhat abstruse chemical point on which someone might be able to give us further information. Might I suggest that a complex chemical action such as this taking place in a paint film might conceivably cause strains and stresses in the film which might result in fissuring owing to the change in volume of the products of the reaction?

Mr. Depièrres made a passing reference in his paper to grey zinc. I am anxious to know whether that material is likely to be employed in this country to any extent. On the Continent it is held in high repute. It appears to me that grey zinc may have certain good points. As to the presence of lead salts (which I take to mean basic sulphate of lead) in oxide of zinc Mr. Depièrres pointed out that up to a certain limit no poisonous properties were communicated to oxide of zinc, but that after this limit has been passed the pigment may be poisonous. I certainly think a limit must be stated, and that the lead salts should not exceed this limit.

Mr. W. F. Reid: It is rather difficult to discuss fully this paper, because it covers the whole ground, and there is little room for anything to be added to it. I have had some personal experience in the production of zinc oxides, and have used a very large quantity of zinc white. With regard to the direct process as shown on several of the diagrams, that is the American process. I do not think that that particular plant is used in Europe, at least not to my knowledge. The ore which Americans use, as has been very clearly stated by Mr. Depièrres, is Franklinite, and it has a great advantage, because it has no volatile impurities. Americans have an ore which is composed of zinc and oxide of iron with manganese, and the residue from this production of zinc white by the direct process is used straight away in the blast furnaces for the production of spiegeleisen. I do not know of any ore in Europe which can be used in the same way. No smelter that I know of will take the residue from the distillation of zinc ores from any district. Americans have a great advantage over us, and that naturally reduces the price of the zinc oxide they can send us, and makes it very difficult for us to compete with them. In Europe the ores are contaminated with a considerable quantity of volatile impurities, and naturally the most injurious of these from the zinc oxide maker's point of view is lead. It is not impossible to get rid of this lead. You cannot take ore direct and distil over the oxides without distilling over the lead and both the oxides condense together in the chambers. You can deal with the mixture in two ways; you can either re-distil it with pure fuel (and I would remark that lead as an impurity in this zinc oxide is not present in the form of sulphate, but in the form of oxide), or you can dissolve the mixed oxides in sulphuric acid and precipitate the zinc in the form of white oxide, or crystallise the sulphate and get pure zinc crystals. With regard to what Mr. Depièrres calls the indirect process, it depends upon which way you look at it. If you start with the production of the oxide, really the direct process is the burning of the metal into the oxide, but if you start with the ore, then, of course, it is the indirect process. The method of collecting this oxide is a matter which affects the user of the oxide very much indeed. The fume chambers with bags, which they have in America, are not in such extensive use in Europe. The reason for the bags is a very obvious one, it is to filter out all the oxide that can be retained. You can do a great deal by proper arrangement with precipitating chambers. One point I think has not been fully worked out by manufacturers working the indirect process, that is, they always use anthracite where they can get it. From experiments I have made myself I find water gas can be employed to produce a better article than you can get with anthracite, it being quite free from ash. With regard to precipitation, I agree with Mr. Depièrres. I have never yet found zinc oxide made by any precipitation process that has anything like the covering power of the distilled oxide. Zinc oxide fixes from 8 to 10 per cent. of ammonia, and, therefore, the loss of ammonia is considerable. With regard to the electrolytic process in connection with carbonate of lime, I cannot follow this, and do not see how it could work so far as the production of zinc white is concerned. Mr. Depièrres asked most of the paint manufacturers here whether they would not prefer an absolute white pigment if they could get it. No doubt they would, but it adds considerably to the cost. On the other hand, I think, when the processes are more fully developed by the production of zinc white in this way, we shall get practically a snow-white oxide in most cases. With regard to the percentage of lead, I do not think it is from a sanitary point of view that it is objected to. I think it is because lead after a time darkens, and darkens more in proportion when in combination with zinc oxide, at least that is my experience. I think when there is a small percentage of lead oxide in the zinc white that the darkening is more in proportion to the percentage of lead than it would be under other circumstances; therefore, I think the objection to the percentage of lead in many specifications is not only due to the sanitary idea but also to the effect of darkening, and you will also find in many cases that this darkening is increased owing to the percentage of lead in the driers put into the oil. There is certainly a little bit of red tape and a great deal of conservatism in some of the specifications of the Government and some public bodies. I can see no reason why the one process should differ from the other. Both are based on exactly the same principle. Great care is required in the second part of the direct process; the point is to burn off at a certain rate the fumes that are evolved. With regard to the treatment of those ores in the furnaces, I did not know there were supposed to be so many secrets about it, but the fact is the process of the reduction of the ores and the distillation of the zinc depends on local conditions. For instance, in Upper Silesia, where coke can be had for 6*s.* per ton, that fuel is naturally used.

Dr. BLACKLER said: Everyone will agree with me that Mr. Depièrres has given us to-night a most interesting lecture, and has elucidated many points of numerous interest; and from what has been said by the lecturer, we are given to understand that a small percentage of lead salts, say 2 to 4 per cent., is not an impurity calculated to reduce the value of zinc oxide when considered as a paint pigment; and Mr. Depièrres has given us most convincing proofs that, on the contrary, this small percentage of lead salts brings about a molecular disposition highly beneficial to the physical state and pigmentary value of this zinc oxide. I quite agree with him in this respect, and my experience as a paint manufacturer and chemist enables me to endorse in full what Mr. Depièrres has said with reference to this much disputed point. The best zinc pigments I have ever handled, as far as body, covering power, and resistance to atmospheric influences are concerned, have been zinc oxides containing a small percentage of Pb, which Mr. Depièrres describes as "Direct Zinc Oxides." I know that the colour of this lead zinc oxide is not quite as good as those manufactured from the metal, but this small disadvantage is more than made up by the qualities which lead zinc possesses; and I feel confident that when all the ridiculous clauses now inserted in many specifications have been altered, we shall find in direct zinc containing from 2 to 4 per cent. of lead salts the most perfect substitute for white lead. Mr. Depièrres has proved to us to-night that he has accumulated much knowledge, and possesses a valuable experience of the subject under discussion; and I am sure that paint manufacturers and those who buy ZnO will be much interested if he will kindly tell us which are the impurities found in ZnO which are injurious to paint and should be guarded against. I am sure his opinion on this most important point will be much appreciated by many manufacturers who buy ZnO largely, and still have much to learn on the subject.

Mr. JENNINGS said: I would just like to say on behalf of painters that they would certainly welcome a pigment in place of white lead for various reasons. Firstly, because of the rate of insurance now owing to the new Act, which is 5*s.* per cent. higher for painters than it is for any other branch of the building trade; and this I am informed is because white lead is used by painters and not by ordinary builders. This is the first point which seems to be of importance. Then, again, the question of poisoning, which is of vast importance. It appears that pretty well every European country has recognised the fault, and has endeavoured to deal with it, but England has left it severely alone except with regard to pottery. It is hoped something will be done before long in that respect. I read to-day for the first time, with a great deal of interest, the text of a Bill which has been introduced in the House of Representatives in the State of Missouri, in which they propose to do all manner of things, and among other things they intend making them put a picture of the skull and crossbones on every package they sell. There are other very excellent provisions in that Bill which may be very well carried into effect. I would like to ask Mr. Depièrres whether, in his reply, he will be able to say something about that which is alleged against zinc oxide, particularly as to its being hard and having a tendency to chip. This is a point which is very interesting. It is not advisable to use zinc oxide by itself as a paint, but it should be mixed with one-third white lead. The durability of the material, I presume, we cannot touch upon to-night, but hope to at some future time. Personally, I think that zinc has a great future before it in this country, but many painters condemn it either because they have never tried it, or because they have tried it many years ago and have used it under unfavourable conditions and mixed it in an improper way.

Mr. MCINTOSH said: Mr. Depièrres, in trying to prove the superiority of zinc oxide over white lead, appears to me to have proved too much, and after having severely condemned white lead and its poisonous nature, tells us that a good zinc oxide cannot be made without the assistance of the poisonous lead salts. Here again my theory that white lead is not, after all, such a bad pigment is proved by the lecturer, who himself admits that lead salt must be present to secure a good white zinc. I am sorry that Mr. Depièrres is not of the same opinion as I am on some of these points.

Mr. WILKINSON said: I should like to say that I approach this subject this evening rather prejudiced against the value of zinc oxide. That prejudice was formed some years ago when I tried zinc oxide, and had the material made up in accordance with the best instructions, but it turned out to be viscous, livery, difficult to manage and difficult to work, and the painter did not make a good job of it at all. I noticed in the course of a year or so that fissures were noticed on the surface which certainly would have spoilt the reputation of any master painter. In those days one could not possibly compare zinc oxide with white lead. I am led to understand, and I quite believe that very great improvements have been made now, and are still being made every day in the manufacture of white zinc, which tends to make it a more suitable pigment for paint making. I am not looking at white zinc at all from the humanitarian point of view, this being a subject on which most authorities appear to agree; and I should say from the very admirable lecture we have received this evening that it is very probable we have now arrived at a state of things where a better article can be produced, and I am convinced that it is incumbent to all paint users to take up the subject again, and personally I intend to go into the matter most seriously.

Mr. DAVIDSON said: Mr. Depièrres emphasises, and rightly, I think, that of the properties sought after in a pigment, chemical purity is of minor importance, whereas the possession of those physical characters which render it suitable for the production of protective and decorative coatings is of paramount importance. This fact ought not to be forgotten by those chemists who may have to examine and select such raw materials. Only those methods of testing should be selected which have a direct bearing upon the purpose for which the raw material is intended to be used. It is getting to be recognised more and more every day, in the paint and varnish trades, that there is a limit to the value of chemical analysis, and that the determination of physical constants is of greater importance. Mr. Depièrres does not give us much information about the testing of oxide of zinc, what tests he would recommend, and how they ought to be carried out. Such information would add to the completeness of his paper. One would be interested to hear, for example, what tests he would propose to apply in selecting a zinc oxide for enamel making; and would a sample which is suitable for grinding into a paint be equally suitable for making an enamel, or *vice versâ.* The combination of zinc oxide with linseed oil has been referred to. I see no reason to doubt the possibility of such a reaction taking place. In the "splitting" of fats by the autoclave process (for the preparation of glycerol and fatty acids) zinc oxide is sometimes used to accelerate the reaction, which takes place under conditions of high temperature and great pressure. While the conditions under which a zinc paint film may be exposed are very different, still the possibility exists of some interreaction between oxide of zinc and the oil or its products of oxidation. If such a reaction takes place, then the product of the reaction must be somewhat inelastic and brittle, judging by the hardness of zinc paint films.

Mr. DEPIERRES replied to the points raised in the discussion as follows: Our Chairman, Mr. Cruickshank Smith, has brought out all the salient points of my paper in a most excellent manner, and his criticism is an important one when one takes into consideration his very special knowledge on the subject of zinc oxide, he being the author of several works on this subject. The Chairman has asked me to explain how the covering power tests which I have made on the experimental board you have in front of you were carried out. The four materials were ground in exactly the same proportion of refined linseed oil, they were then mixed to a proper consistency with thinners composed of three parts boiled oil and one part of turpentine, three parts of pigment being used for one part of the thinners. They were applied carefully on the surface of the board, in each case the material being quite unknown to the man who carried out the test. To ascertain the spreading power of these various paints, I had three different tests made on wall surfaces of 25 square yards, the average spreading power being obtained by taking the average in each case, which I may say was practically the same in each case. The calculations gave the following results:—

One gallon of paint made with white lead covered 77.45 square yards; one gallon of paint made with the zinc manufactured in Holland covered 98.87 square yards; one gallon of paint made with the American zinc covered 99.10 square yards; one gallon of paint made with the Silesian of zinc covered 100.20 square yards. As you will see, the spreading power of the white zinc is practically the same, whereas that of the white lead falls a long way behind, and if one can establish some sort of calculation in which spreading power, obscuring power, durability and cost of the material are all taken into consideration, we find again here that the lead zinc easily demonstrates its superiority over all the others in every case, the white lead being a much more expensive pigment to use.

With regard to the combination of zinc oxide with linseed oil, what I have stated is not absolutely my own theory, but one expounded by a chemist of renown, who has made special studies on the subject. Personally, with the experiments I have made, I have been unable, up to now, to get 20 per cent. of zinc oxide to assimilate with linseed oil; the maximum amount I have obtained being 2½ per cent. Here is a bottle of oil containing this proportion.

With regard to the use of grey zinc, that is to say, the produce collected in the chamber "A," plan 1, which, as I have said, contains metallic zinc, zinc oxide pure and agglomerated, I am fully aware that it is held with some appreciation on the Continent, and has been recommended on account of its supposed anti-corrosive properties. I have made several experiments to ascertain whether this was the case, but up to the present I have been unable to arrive at a satisfactory conclusion, and I have not so far found that it possesses any good points in this direction.

With reference to lead salts contained in zinc oxide, Mr. Cruickshank Smith is perfectly correct in saying that it consists principally of basic sulphate of lead, and there is no doubt that the small proportion contained cannot be dangerous at all to health. I have visited factories where a large number of men are employed in the manufacture of lead zincs, and have been told that a case of lead poisoning had never occurred there; several men examined did not exhibit any sign of plumbism. Mr. Cruickshank Smith asked me what I considered should be the limit of lead salts in lead zinc which I recommended, and I will again say that I consider 2 to 4 per cent. is a limit that should not be exceeded.

Mr. Reid is quite correct in saying that the furnaces I have shown you are used in America in the Wetherell (?) process, but they are also used in Europe, and the plans you see here to-night have been taken from European factories. No doubt the manufacture of direct zinc originated in America, but I know a few factories in Europe who are now manufacturing by this method, and producing what might be almost called irreproachable products. With regard to the removing of the impurities contained in lead zinc, I know experiments have been made in that direction, and no doubt it would be possible to remove the traces of lead oxide, but it would be more difficult to remove the traces of basic sulphate of lead. In any case I do not think that this process can be a commercial success, as the expense would be too great for what I should term an illusory advantage. With regard to the darkening of zinc oxide containing lead salts, if the proportion of 2 to 4 per cent. is not exceeded and the greater portion of these lead salts are composed of basic sulphate of lead, I am quite sure this objection is of no importance, basic sulphate of lead being a very staple pigment. In conclusion I will say that I am most gratified to see that a gentleman possessing such a great knowledge and experience as Mr. Reid should agree with me that the chemical purity of zinc oxide is any indication of its value as a paint pigment.

It is most gratifying for me to find that a man like Dr. Blackler, possessing not only a perfect chemical knowledge but also having excellent technical and practical experience in paint making, should agree with me in the opinion I have expressed as to the undoubted value of lead zincs containing from 2 to 4 per cent. of lead salts. What he has said will strengthen my belief, and help, I hope, to eradicate many of the absurd prejudices now existing in many public bodies, and perhaps induce them to alter their antiquated and unreasonable specifications. Dr. Blackler has asked me to give you my opinion as to the best method of selecting a ZnO for use as a paint pigment. Gentlemen, this is a most difficult question, and one I quite expected a man like Dr. Blackler would ask. It is absolutely impossible to define the quality of a ZnO by estimating the amount of chemical impurities. But reverting to what I have already said, lead salts not exceeding 2 to 4 per cent. should not be considered as harmful impurities; in fact, on the contrary, it is beneficial. $ZnSO_4$ is no doubt a most undesirable impurity which has a very bad effect on the oil affecting the vitality of the paint film. The presence of $SO_2$ sulphuric dioxide and $SO_3$ trioxide is also injurious in ZnO, and especially when there are no salts of lead present, as you will quite understand that $SO_2$ and $SO_3$ is capable of combining with basic oxides, the first to form sulphites, the second to form sulphates; therefore, if lead is present you will have $PbSO_3$ and $PbSO_4$, two very staple pigments. But if you take ZnO free from lead the same thing does not happen, and the $SO_2$ and $SO_3$ combine with the zinc to form sulphate and sulphite of zinc, which are soluble and have a bad effect on the paint film—one more good point for lead zincs. But I will end by saying that the chemical test must always be made in connection with the practical test; and there again, as in many instances in our industry, the chemist and the practical man must go hand in hand, and each has work of equal importance to do.

Mr. Jennings has mentioned an interesting fact in connection with the insurance rate being 5*s.* per cent. higher for painters than for any other branch of the building trade, and I am quite sure that if the use of white lead was prohibited in England this difference would not exist. With regard to the supposed drawback of zinc paint becoming very hard and chippy, I think this has undoubtedly occurred in many cases, but in my opinion this is always due to the imperfect preparation of zinc paints. A properly prepared zinc paint will last longer, will not chip or chalk as quickly as white lead. This has been demonstrated in all the tests that have been made in Holland, Belgium, France, America and elsewhere.

I am astonished to see Mr. McIntosh, a man possessing such an excellent chemical knowledge, stating that after having condemned white lead I am obliged to go back to a poisonous substance to obtain a good zinc. I will only remark to Mr. McIntosh that often poisonous substances in small doses have their uses, and one or two grains of calomel may have a most beneficial result, whereas 20 grains would be absolutely disastrous. I think this simple illustration will prove to Mr. McIntosh that my theory is, after all, a good one.

Mr. Wilkinson has told us to-night that some years ago he had carefully tried zinc oxide, and found he could not possibly get satisfactory work from it. I know this has been the case with many master painters, but I am glad to see that he is again to-day ready to give this admirable pigment another chance, and I am sure that if his paint is properly prepared, and the zinc oxide he uses a good one, he will soon be convinced of the superior qualities of this pigment. I have purposely avoided to-night, in my paper, giving special information as to the mixing of zinc paint. Several books have recently been published dealing with this subject at some length, and our chairman, Mr. Cruickshank Smith, has himself published one quite recently, where some valuable information can be obtained on this subject.

Mr. Davidson's remarks have been most interesting, and with regard to the testing of zinc oxide, what I have said in answer to Dr. Blackler's remarks will also apply to Mr. Davidson.

Mr. Depièrres thanked everyone very much for the very kind reception he received, and was accorded a hearty vote of thanks for his paper.

## ELECTION OF LICENTIATES, R.I.B.A.

At the Council Meeting of June 6 the following candidates, having been found eligible and qualified under the Charter and By-laws, were elected Licentiates of the Institute in accordance with the provisions of By-law 12:—

ABERDOUR, James Gordon; ALLEN, George Pemberton; BAILEY, William Henry (Maritzburg); BARNARD, Leonard William (Cheltenham); BELSHER, Bernard James; BENNETT, John (Bolton); BETENSON, Frederic Roger, F.S.I.; BISSELL, George Ernest (Colchester); BOURNE, John Charles; BRIGGS, George Hamilton; BROOKS, Stanford Morton (Glasgow); CALLCOTT, Charles William; CHURCH, Arthur Harold; CLARK, Charles Richmond Rowland (Basingstoke); CLAY, George Felix Neville, B.A.Cantab; COLERIDGE, John Duke; COLVILLE, Hubert Leonard; COOK, Ellis Taylor (Rotherham); COX, Bernard Joseph Farrar; CREIGHTON, Henry Richard; DAVIDSON, William, *Owen Jones Student* 1904 (Edinbro'); DAVIES, Ivor Samuel (Bangor, N. Wales); DAVIS, George Walesly (Darlington); DEWES, Walter; DIGHT, Alfred Henry (Birmingham); DUFF, John (Rephad, Stranraer); FRY, Peter George (Weston-super-Mare); GEORGE, Allan; GILBERTSON, Alfred (Liverpool); GRIFFITH, Edward Henry Herbert (Ringwood); GUNSON, Ernest (Manchester); HARBER, William Francis; HAVERS, Albert Charles (Norwich);

HEATHCOTE, Charles Harold (Manchester); HEATHCOTE, Ernest Grigg (Manchester); HEWITT, Stanley Goodison (Liverpool); HOOK, John; KEMPSTER, Fred; LAING, Henry George Malcolm; LAWRENCE, Joseph Thomas; LUCAS, William Louis, B.A.Cantab; MARTIN, Robert (Manchester); McLACHLAN, Herbert Guthrie; NEWMAN, Charles James (Rugby); NORTON, Charles Harrold; PARTRIDGE, Sidney Herbert (Newton Abbot); PULLIN, Charles Henry; ROBERTSON, George Birrell, *President of the Institute of Architects of N.S.W.* (Sydney, N.S.W.); SCRIVENER, Harold Moore (Northampton); SHANN, Frank Halliwell; SHARPE, Thomas William; SHELMERDINE, Edmund John; SIDWELL, Henry Thomas (Rayleigh, Essex); SINCLAIR, Colin, M.A., F.S.A.Scot. (Glasgow); SKIPPER, Charles Frederick (Cambridge); SMITH, William Auger (Nottingham); TANNER, Douglas George (Eastbourne); TATCHELL, Sydney Joseph; TAYLOR, William (Aylesbury); TOOMBS, Edwin Ashley; TOWNSEND, Charles William; WATERWORTH, John Halsted; WEBB, William Herbert; WILLIAMSON, Walter (Bradford); WINDER, Thomas, Assoc.M.Inst.C.E. (Sheffield); WINDSOR, Frank; WIRE, Wilfred Travers.

## ARTESIAN WELLS IN THE CITY OF LONDON.

THE revised charges for water supply made by the Metropolitan Water Board are frequently so onerous on property in the City of London that many owners have been tempted to sink wells of their own, and a full inquiry on the subject has been made and an exhaustive report presented by the Medical Officer of Health to the Court of Common Council, from which we extract the following:—

The water supplied to the City of London by the Metropolitan Water Board is obtained from the following sources:—

(*a*) The New River District (formerly the New River Company), the sources of supply being from Chadwell Spring, the River Lea, and eighteen chalk wells. (*b*) The Eastern District (formerly the East London Water Company), the sources of supply being from the River Lea, the Thames at Sunbury, and chalk wells and springs.

The New River District embraces the whole of the City with the exception of a few supplies in the parishes of St. Botolph, Bishopsgate, and St. Botolph, Aldgate, which are in the Eastern District.

It will be seen that both districts are dependent for some part of their supply upon water derived either from the River Thames or the River Lea. Although every effort is made by the Water Board to ensure that the water supply under their control is free from impurity, the fact remains that no navigable stream, passing through thickly populated areas, should be used as a source of public water supply if other and better sources are available.

In making these observations no condemnation of the Water Board's methods is implied, but they bear upon the question under consideration.

Taking all the circumstances into consideration, I concur in the conclusions of the Royal Commission on Metropolitan Water Supply of 1892:—

"That the water as supplied to the consumer in London is of a very high standard of excellence and of purity, and that it is suitable in quality for all household purposes. We are well aware that a certain prejudice exists against the use of drinking-water derived from the Thames or the Lea, because these rivers are liable to pollution, however perfect the subsequent purification, either by natural or artificial means, may be; but having regard to the experience of London during the last thirty years, and to the evidence given to us on the subject, we do not believe that any danger exists of the spread of disease by the use of this water provided that there is adequate storage, and that the water is efficiently filtered before delivery to the consumers."

It is the qualification in the last sentence that influences me in preferring a water that is of unquestionable character at all times. Even admitting that the citizens have no reason to take exception to the quality of the water sold to them by the Metropolitan Water Board, there can be no question that they complain bitterly of the charges levied on them for an indispensable element. It is therefore not difficult to account for the great increase in the number of artesian wells sunk within the City during the last two years, it being most unlikely that property owners would fail to avail themselves of a water supply of the highest quality lying beneath their feet.

This method of obtaining a water supply in the City is by no means a novel one, since an artesian well, sunk at No. 20 Old Broad Street (formerly the site of the Excise Office), is described in the Transactions of the Institute of Civil Engineers, vol. 1, p. 155, published in 1836. (This well became subsequently contaminated with polluted surface water, and a new boring was made, in 1908, on the old site.) One well was also sunk in the City in each of the following years, viz., 1851, 1874, 1883, 1885, 1887, 1891, 1892, 1901, 1902, 1905, and 1907; two were sunk in 1903; and eleven each in 1908 and 1909. It will be seen that fourteen wells were sunk during the seventy-one years 1836-1907, the remaining twenty-two, or 61 per cent. of the whole number, being made in the years 1908 and 1909.

With regard to their purity, Dr. Teed reports that:—"The waters are highly pure so far as organic contamination is concerned, they are soft, but on the other hand they are somewhat saline. The total solids average 49 grains per gallon, whereas London water runs about 20 grains to the gallon. The London deep well waters contain fair amounts of bi-carbonate of soda and sodium sulphate, which I have known to be a source of considerable trouble to steam raisers."

"Lead and copper were absent in all cases."

Figures have been published in the Press claiming that, in consequence of the present high charges of the Water Board, great economy can be effected by sinking an artesian well and drawing water therefrom.

An example which may be quoted is that of a large West End hotel which was paying 900*l*. a year water rate. A well and pumping plant was installed at a cost of 800*l*., and the total cost of running this plant, including repairs, has been found to be 200*l*. a year. Thus a saving of about 700*l*. appears to have been effected by a capital expenditure of 800*l*. It is obvious, however, that if the yield of water proves later insufficient for the intended service the Water Board's supply will have to be laid on to the premises and the money sunk in the well written off as a loss. This leads to the consideration of the question of the fall of water level in the London basin, which is the geological formation upon which the City is situated.

Much difficulty has been experienced in getting reliable information in the City upon this point. While it is generally admitted that the water level is falling, the rate of fall does not appear to be uniform. This discrepancy would probably disappear if the normal rest level of the water in each case could be determined with accuracy.

In many wells the depth at which the water stood in the bores when completed can be obtained from the well sinkers, but except in those cases where a well shaft has been sunk before commencing the bore hole it is difficult to ascertain the water level at the present day. A disturbing factor it is impossible to eliminate, in making exact estimates, is the proximity of the wells to one another in the City, and the intermittent character of the pumping.

In the City alone there are thirty-six of these wells in use, all being supplied with water from the same source. Moreover, the Metropolitan Water Board largely tap the water supplies before it reaches the City, and there are now no less than forty-nine wells belonging to the Board drawing upon the water in the chalk. This depletion cannot be expected to continue indefinitely without seriously affecting the interests of well owners.

On this point the views of Mr. W. Whitaker, B.A., F.R.S., taken from the Memoirs of the Geological Survey of England and Wales in the first volume of the "Geology of London and part of the Thames Valley, 1898," p. 508, may be quoted:—

"In London and the neighbourhood the increased demand for water led to the increase in the number of wells and to the comparative exhaustion of the limited supply in the Tertiary sands. Many wells were therefore deepened to the chalk, and new wells were made to that foundation, and the large quantity of water taken from these wells, amounting to several million gallons a day, has lowered the underground water level in the chalk under London until it becomes questionable whether further well sinking in most parts is likely to be successful, though there are still overflowing wells in suburban spots."

Although, as I have pointed out, there are difficulties in measuring with exactitude the rate of fall in the water level, a fair approximation can be arrived at.

Messrs. Le Grand & Sutcliffe have kindly favoured me with figures relating to seventeen wells sunk in the Metropolis between the years 1883 and 1889. These show an average annual fall in water level of 3.18 feet.

Measurements have been made at a well belonging to the Corporation of London sunk to supply water to several "blocks" of artisans' dwellings in Stoney Lane, Houndsditch.

The late Colonel Haywood reporting on this well in 1893 gave the normal water level at 123 feet from the surface. From recent measurements made under the direction of the City engineer it is shown that the level has fallen on the average 3.37 feet per annum.

It will be seen from the foregoing that there is an element of speculation in investing money in well sinking in London. In the first place, owing to unforeseen circumstances, they may be costly investments, the City well at the artisans' dwellings referred to above costing no less than 5,610*l.*, while the cost of pumping alone costs 5½*d.* per 1,000 gallons. This is allowing for all contingencies except interest on capital outlay and depreciation of plant, &c. It must be pointed out, however, that this particular well was an exceptional case. Since it was commenced, twenty-three years ago, far less costly methods of construction have been generally adopted.

The practice of commencing the well with a shaft upwards of 200 feet deep, and lining the same throughout with impervious material to avoid dangerous leakage from contaminated surface water, and commencing the boring at the bottom of such shaft, is now rarely followed. The progress of the work on the City well was at times very slow, Colonel Haywood mentioning that 110 working days were occupied in passing through 5 feet 10 inches of conglomerated rock. Commenced in 1887, the well was not finished until 1891.

Further, when the work is completed, the supply of water yielded may be so scanty as not to be worth spending money on pumping, labour, and maintenance. This latter has actually been the case in at least two cases in the City, but I have no means of knowing how many other wells in the City have been abandoned for the same reason.

When the well at the Manchester Hotel, Aldersgate Street, was sunk in 1891 the water level was 133 feet from the pavement level. This distance was reported to be 172 feet on a Monday morning in May 1908, a drop of 39 feet in seventeen years, showing an average lowering of the water level of 2.3 feet per annum.

Again, at a well sunk at Salisbury House, London Wall, in 1901, the water level fell 19 feet in seven years, or 2.7 feet per annum.

In the course of the inquiry conducted by the Royal Commission on Metropolitan Water Supply, appointed in 1892, many experts gave evidence regarding the falling of the water level in the chalk beneath London. Thus, Professor W. B. Dawkins gave an illustration of a well that had fallen 18 inches a year for many years, and stated that beyond all doubt the water level was falling, but that the rate of falling was extremely irregular.

Mr. J. Francis (chief engineer to the New River Company) was of opinion that under London there was a fall of nearly 18 inches a year, and that he attributed the lowering of the water level under London to the increased pumping that had taken place under London itself. Mr. A. R. Binnie, chief engineer to the London County Council, said there had undoubtedly been a general fall in the water level in the chalk under London of about one foot per annum. It does not fall regularly, and there may have been rises at intermediate periods owing to wet weather. Further, that the quantity of available water in the immediate neighbourhood of the basin of the London chalk was becoming exhausted.

This last view is not quite so disquieting as it appears. This falling of a water level does not necessarily lead to the immediate abandonment of a well. The simple expedient of lowering the pump will give the well a new lease of life, and as many well-makers put the pump 100 feet below the water level, the well will last for some years at the present rate of fall of water level. Further, by deepening the bore a well may give an increased yield.

It hardly falls within my province to express any opinion as to the advisability or otherwise of attempting to secure an economical water supply in the City by means of artesian wells. As before stated, there must be an element of speculation in the matter, and the only persons qualified to answer the question authoritatively are geologists and hydraulic engineers who have made a special study of the subject.

When it comes to the question of the quality of the water obtained from this source of supply there can be no doubt that it is of unquestionable wholesomeness, and that from the fact of its being very "soft," it is better suited for domestic and manufacturing purposes than that delivered by the Metropolitan Water Board.

In this connection I may fittingly conclude by quoting from the Report of the Rivers Pollution Commission previously referred to:—

"Of the different varieties of potable water the best for dietetic purposes are spring and deep well waters. They contain the smallest amount of organic matter, and are almost always bright, sparkling, palatable, and wholesome, whilst their uniformity of temperature throughout the year renders them cool and refreshing in summer, and prevents them from freezing readily in winter.

"Such waters are of inestimable value to communities, and their conservation and utilisation are worthy of the greatest efforts of those who have the public health under their charge."

## ACTION FOR NEGLIGENCE AGAINST AN ARCHITECT.

In the Court of Appeal on Wednesday, June 8, Lords Justices Vaughan Williams, Fletcher Moulton, and Buckley had before them an appeal by the plaintiffs in the case of the Guardians of the Poor for the parish of Leicester against Trollope, from an order of Mr. Justice Bucknill. There was also a cross-notice by the defendant.

By their action the Guardians sued Mr. John E. Trollope, the sole surviving partner of Messrs. Giles, Gough & Trollope, architects, of 28 Craven Street, Strand, for damages in respect of alleged negligence on the part of the defendant as architect to the plaintiffs, and for alleged breach of agreement to carry out certain work at Evington, in the county of Leicester. The plaintiffs appealed from an order of Mr. Justice Bucknill, whereby his Lordship directed that the action should be referred to an Official Referee, and refused to order that the question of the alleged liability of the defendant should be heard first and all other questions reserved.

Mr. Trollope cross-appealed, asking that, in the event of the plaintiffs' appeal succeeding, the venue should be changed from Leicester to London, on the ground that the matter had been much discussed in Leicester, both in the Press and on public platforms.

It appeared that in 1900 the Guardians contemplated the erection of infirmary, epileptic, and imbecile blocks and other buildings at Evington, and, in pursuance of that scheme, entered into a contract on November 20, 1900, with the firm of Messrs. Giles, Gough & Trollope for them to prepare plans, specifications, &c., for the work and to superintend the erection of the buildings, the firm to be paid 5 per cent. upon the total outlay. Tenders were invited, and that of Messrs. William Moss & Son, Ltd., of Loughborough, accepted. After the final certificate had been paid, the plaintiffs discovered that dry rot had set in, and they claimed against Mr. Trollope on a contention that the firm were liable for damages for not having properly superintended the work. The defendant entered a denial of this allegation, and counterclaimed on a plea that, if the Guardians established their claim to damages, he was entitled to a similar sum, the defendant complaining of the manner in which the duties of clerk of the works had been attended to. It was to this source that Mr. Trollope wished to trace the cause of complaint.

Mr. Hugo Young, K.C., was outlining the nature of the appeal on behalf of the plaintiffs when, upon a suggestion from the Bench, he and Mr. Pollock, K.C. (for the defendant), had a consultation.

Subsequently it was announced that an order had been agreed upon as follows:—

"By consent, the case to be tried before a Judge alone in London, the question of amount not to be tried in the first instance, but in such a way as the Judge might direct, the costs of the summons and of the appeal to be costs in the cause."

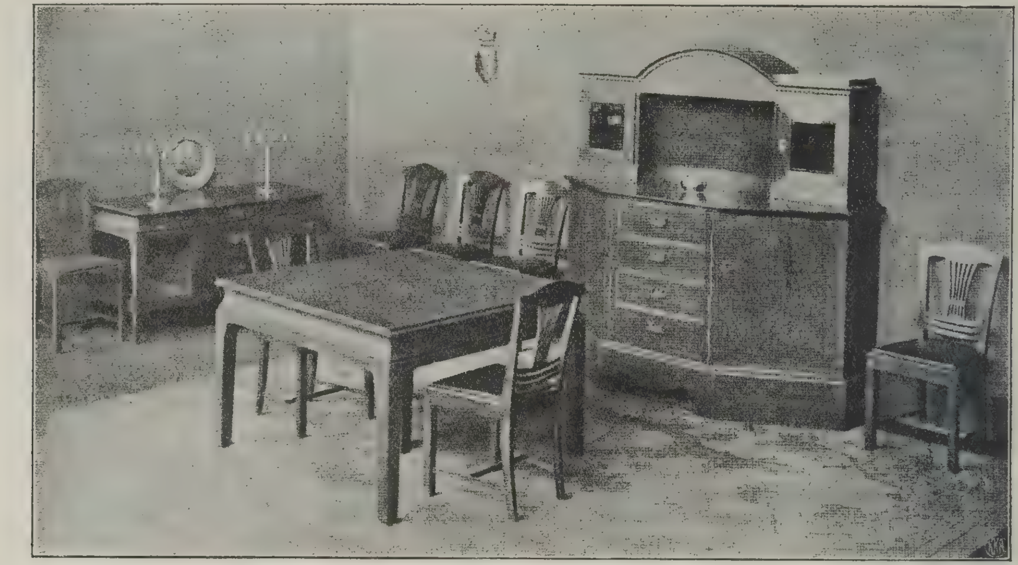
## THE ILLUMINATION OF INTERIORS.

### LECTURE I.—PRINCIPLES AND DAYLIGHT ILLUMINATION.

A lecture under the above title was given last Wednesday evening at the East London College (University of London) by Professor J. T. Morris, M.I.E.E., and some very interesting facts were brought out. In his opening the lecturer remarked that although so familiar in a general way there is probably no subject on which so many erroneous ideas exist as on illumination. For instance, if the average person was given a piece of print to examine first in an average lighted room and then in broad daylight, and asked to state how much brighter he considered the illumination in the second case was than in the first, it is probable that he would consider ten times as bright a very generous allowance. As a matter of fact, the number should be from 100 to 10,000 times. Similarly, the huge variations which take place in

## MODERN EUROPEAN ARCHITECTURE.

### NORWAY.



[From *Arkitektur og Dekorativ Kunst.*

DINING-ROOM FURNITURE.—Designed by Mr. H. Bull, Architect.

daylight are very little realised. As an example the lecturer showed a curve plotted from readings taken during the afternoon and evening of June 7 last, which would be considered an average bright day. When the sun was obscured for a short time the intensity of illumination fell off to one-third of its maximum value, while at 6.30 the light had only about $\frac{1}{200}$th of its value at 1.30. It may be mentioned that at this latter time the intensity was about 3,500 candle feet.

By 9 P.M. the light was not much more than $\frac{1}{20000}$th of the midday illumination. On the grounds being lighted up with arc lights the illumination rose to 0.1 candle feet, which can be compared with the figures already given. Turning to the question of the ratio of indoor to external illumination, some interesting figures were given, obtained both at the East London College and in several well known buildings by Mr. Waldram. The latter showed that the intensity of illumination inside to outside was:—

| | |
|---|---|
| In a new elementary school, desks ... | 0.0025 to 0.008 |
| Ordinary offices, average ... ... ... | 0.001 |
| House of Commons, Speaker's chair ... | 0.0009 |
| ,, ,, members' seats ... | 0.0003 to 0.0007 |
| Charing Cross station, booking-hall ... | 0.0001 to 0.0003 |

These ratios will, of course, depend on the ratio of area of windows to area of floor. The reasons for the eye being unable to judge these huge differences were then explained. It is partly owing to the contraction of the size of the pupil. The results of a number of experiments on this variation were given and illustrated by curves.

The photometer used throughout the tests was that devised by Mr. A. P. Trotter, and the principle of the working of this instrument was explained and demonstrated by the lecturer. The next two lectures of this series (which are free) will be on "Illumination by Gas and Electricity," by Professor J. T. Morris, and "Illumination by Petrol Air-Gas," by Professor C. A. M. Smith, B.Sc.

## THE RESTORATION AND RECENT DISCOVERIES AT THE GUILDHALL, LONDON.

(*Continued from last week.*)

IN the old views of the Guildhall which we have seen, the banners hanging from the walls were taken at the battle of Ramillies in 1706. There were sixty-three colours, and upon application by the Lord Mayor in November 1706, the Queen "was graciously pleased to declare she would bestow" them "to be hung up in the Guildhall of this city," and the Duke of Marlborough was invited to dinner. I have been unable to find the date of the removal of these banners, and all traces of them have, unfortunately, been lost. Although they were brought to the hall with much pomp and circumstance they have vanished—nobody knows when or where.

You are no doubt aware that the work of restoring the porch to the Guildhall is now well in hand. The original porch, known as "The Guildhall Gate," was erected in 1425, and was very different from what we understand as an ordinary porch, for it was the full width of the Guildhall yard, about 63 feet wide; it had two doorways in it, and was in part certainly three storeys high. The upper portion of the porch suffered considerably at the Great Fire of London, and was restored by Wren in 1669. He rebuilt the destroyed portions in a severely Classical manner, the central feature reminding one somewhat of Temple Bar. Below Wren's work there were six of the original statues erected in the fifteenth century; these were only removed when Dance's front was erected in 1789, and they are traceable down to 1846, when they were sold for 100*l*. to a Mr. Henry Bankes, M.P. for Corfe Castle. I have tried to ascertain if they are still in existence, but up to the present I have failed to get any information. These statues are often confused with those from the Guildhall chapel; these three are in the Guildhall Museum.

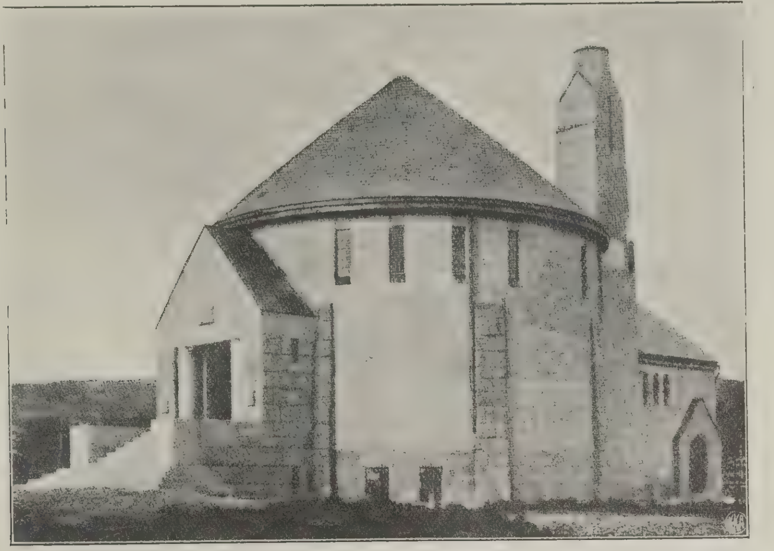
The small doorway gave access to steps that must have led down to the crypt entrance, which was about 7 feet 10½ inches below the level of the Guildhall yard at that date. I had an opening made to examine the foundations before commencing the present restoration, and was delighted to find one stone of the jamb of this original smaller entrance; this is about 2 feet 3 inches by 1 foot 8 inches by 12 inches, and is deposited in the crypt and labelled.

The original porch, with Wren's alterations, was pulled down in 1788, a fact which is ever to be regretted. Dance's porch was very nearly treated in the same way, and a modern porch erected by Sir Horace Jones, but let us be thankful that did not happen. He pulled a third of it down and died.

For a moment let us consider Dance's work. In the first place we must remember he was a very good architect; he was one of the first Royal Academicians, and Professor of Architecture at the Royal Academy; he was the architect for Newgate, a grandly designed prison, which unfortunately had to be pulled down a few years ago, as it was not suitable for modern requirements. Dance was trained on Classical lines and had studied in Italy; it is quite clear to anyone that he had no knowledge of Gothic architecture, and he attempted to build a Gothic porch. The result is of the greatest interest to students. In the first place I know of no other attempt on his part to carry out Gothic work. What did he do? To begin with he was very careful that his building should be similar to the old porch as far as the line and extent of frontage were concerned. Next he divided his building into three parts, the centre portion being higher than the two sides. This, again, as far as we can tell, was following the lines of the old building. His design was well-balanced and quaint in the extreme; it has an Eastern influence about it, and as we see it to-day it is a beautiful piece of colour. Horace Jones wanted to pull it down, and so did a few men recently,

## MODERN EUROPEAN ARCHITECTURE.

### NORWAY.



[From *Arkitektur og Dekorativ Kunst.*

CREMATORIUM IN THE OLD CEMETERY AT CHRISTIANIA.—Mr. Oscar Hoff, Architect.

when the question of dealing with this part of the Guildhall was discussed last autumn. To me it seemed it ought not to be criticised solely from an æsthetic point of view ; it is something more than a piece of architecture, it has the right to be considered as a landmark in the City ; it has been reproduced on menus, programmes, gold caskets, &c., which are to be found in all parts of the world ; it seems in a sense to be a trade-mark of the Corporation, and good architecture or bad architecture, it seemed to me a pity that the Corporation had allowed one wing to be pulled down for the purpose of exposing quite a modern casing to an old building. The architectural Press carefully considered the matter, Mr. Thackeray Turner, Mr. St. John Hope, and Mr. Ernest George, A.R.A., wrote most valuable letters in favour of the restoration and against further mutilation. These letters were laid before the Court of Common Council, and coming from such eminent men, they naturally had great influence upon the Court which decided in its wisdom that Dance's work was not to be destroyed, but that the missing portion should be restored. The work is well in hand, and should be finished this autumn.

The doorway to the room over the porch is part of the original structure, the brickwork, &c., around it has just been cleared away and the big splay exposed, the corbelling out has also just come to light. I traced the splay through the stone casing of the exterior of the hall, and the history of this part of the building is now clear. Originally the stairs were in the thickness of the wall, over them there was a big relieving arch ; the springer at the lower level is seen, this arch being carried right across the wall where the window now is. It is obvious there could have been no window there, such as we see to-day, and the line of the old wall is still distinctly seen at the top and at the bottom of the staircase, which was partly at the back of the fine entrance to the crypt. At a subsequent date the window was inserted, and the wall thickened, but this meant infringing so much on the width of the stairs that they would become useless. Consequently the outer wall or face of the crypt entrance was mutilated and partly removed, and the steps, as existing to-day, were forced more to the south. This window was seen from the Guildhall Yard, and if Horace Jones had in view the exposure of the window when he pulled down Dance's work, it is clear that he was bringing to light something very modern. The casing and old face at the back are now exposed, and I hope always will be.

Until last summer almost the entire wall surface of the Guildhall was covered with a preparation of cement about one-sixteenth of an inch thick. This had been painted and distempered, with the result that the sharpness of the mouldings had disappeared, and it was very difficult to distinguish between the original Gothic and the imitation work which has been carried out from time to time. I will be quite candid, and say that although as a casual observer I used often to enter the Guildhall previous to my appointment, with exception of the porch I never considered the building genuine ; but as soon as I studied it I found out my mistake and I had small portions carefully cleaned off right down to the stonework and these were inspected by members of the Corporation. This plaster and paint work is said to have been started in Wren's time, the object being to paint the new stone used in restoration work after the Fire, and also the stone blackened by the flames, so that the whole should have what was considered a pleasing and uniform appearance. When I first brought this matter forward I was asked if it was not a fact that portions of the stonework were damaged and greatly discoloured by the flames, and my reply was that as the Corporation apparently owned the only building in existence showing traces of the Great Fire of 1666, this was the very reason for showing the large number of visitors a sight unique in London. That view was adopted and as you are no doubt aware, the work was carried out last August. The result is very interesting. We can see clearly the line of the old walls raised upon by Wren, we see the clean stone of the modern windows at a glance, the wheat is separated from the chaff, a stone building is on view in place of one of plaster and paint, so that he who runs may read. One point may be of interest : it was handed down by tradition that the Fire was most fierce along the eastern end of the southern wall ; that tradition proved true, for that part of the old stone is blacker than any other portion of the Guildhall, and the contrast with the light grey of the west end of the north wall is very great.

Two years ago the crypt was in a still worse state, and it was fitted up with gas pendants, common T pieces hung from the vaulting ; these have all been removed, the gas-stoves are going, and the whole crypt has been lighted by electricity. I wanted to get a strong and well-diffused light, but I did not want to use pendants ; I particularly wanted the vaulting to appear as it was in the fifteenth century, and any line of pendants must have formed a perspective to detract from the line of the main ribs of the groins. Consequently, I had some simple shaded lights made in the form of a scoop ; one is fixed on the wall in each bay. There is ground glass below and looking glass at the back, the light is directed upwards and the crypt has the effect of being lighted by reflected rays, for there are no burners to catch the eye.

When Wren rebuilt the roof after the Great Fire he raised the walls as described by Richard Blome, who states :—

"The great hall being formerly in height up to the upright of the walls, not above 30 foot, which now are raised 20 foot higher on either side and at both ends, where there are fair windows, and eight large windows on either side, of 16 foot high each window, where there were none before, and over all the flat roof and platform leaded, with battlements abut it ; whereas before the roof did meet at the top as in common buildings."

This refers to the storey with circular-headed windows which we have seen, and which remained until the present roof was erected in 1865.

A report made to the Guildhall Improvement Committee in 1864 (with reference to the side corridors below the circular leaded lights, which light the hall on both sides), states:—"The original windows still exist intact, by which light was obtained through the lateral walls of the hall, beneath the level of a continuous cornice covering a wall-plate." These windows had been bricked up so as to provide convenient wall space upon which the portraits of twenty-two judges were hung, who settled disputes that arose in consequence of the destruction of property by the Great Fire. Their portraits were painted by Michael Wright; the price was settled by tender, 36*l.* being paid for each of them; the table used by the judges is still to be seen in the Guildhall Museum. These side windows were opened up in 1864, and all of them have been renewed; the end windows have been hacked and cemented over outside and pieced inside, consequently the only window now to be seen as it was when constructed in the fifteenth century is the newly discovered window, which I deal with later. Again, with the exception of a certain amount of stonework in the lower portions of the buttresses, and small portions of stonework in other parts, no portion of the exterior of the great hall dates from the fifteenth century, while most of it is quite modern.

(*To be continued.*)

## OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* (New York) has an interesting account of the American Academy in Rome, by William Walton, with views of the various houses in which the Academy has been successively located, the Villa dell' Aurora, the Villa Mirafiori, and the Villa Aurelia. Our contemporary's illustrations include the Institute of Musical Art, New York, by Mr. Dann Barber, a refined design based on Italian Renaissance, and several works by Mr. Valentine B. Lee, in and around Philadelphia.

*La Construction Moderne* (Paris) continues its illustrations of the Oceanographic Museum at Monaco. There is a scathing article on the vandalistic desecration of the Palace of the Popes at Avignon, by the display of vulgar advertisements.

*Arkitektur og Dekorativ Kunst* (Christiania) describes and illustrates the new church at Aalesund, recently completed from the designs of Mr. Sverre Knudsen, which were selected in competition.

*Der Architekt* (Vienna) is very new-arty this month, with a design for a private house in Buenos Aires, by Otto Schöntal and F. Perez-Sacre; a church at Bodenbach by Heinrich Ried, a "study" by Karl Ernstberger, of the Wagner school, and some smaller domestic work. As a relief two views are given of barock doorways at Linz.

*Engineering Record* (New York) contains an interesting account of a series of tests on the permeability of concrete, with and without the addition of various substances intended to give waterproofing qualities. These were made for the Commissioners of Sewerage of Louisville, Kentucky, under the general supervision of Mr. J. B. F. Breed, chief engineer, and Mr. Harrison P. Eddy, consulting engineer to the Louisville Commission.

## Correspondence

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

### Ashbins versus Ashpits.

Sir,—I should like the opinion of and a few questions answered by the readers of your valuable paper on the above subject.

Which do they consider the best system for removing house refuse under *practical* circumstances, and what has been their professional experience whether the present bin or the old covered ashpit is the most sanitary under *practical* circumstances?

What is included in refuse? Are ashes, kitchen waste, lawn-mown grass, and refuse and rubbish after general spring cleaning, including old crockery, pans, mugs, &c.?

Are the Urban District Council or Corporation compelled by Act of Parliament to clear all refuse, including the above items?

I am of opinion that local authorities or corporations should clear all rubbish, whatsoever it may be, free of extra charge.

What is the law on this?

How often are ashbins intended by law to be removed?

Ashbins undoubtedly are the most sanitary from the *theoretical* point of view if the bins are removed every morning.

But when they are removed only once a week or a fortnight in some districts the bin becomes too full and overflows, and the remaining refuse is allowed to accumulate in sundry corners of the yard, which is worse than no bin at all, and therefore the old covered ashpit would have been the best.

I have in my mind a district where the local authority refused to remove the garden refuse, &c. Burning it was the simplest and most sanitary, but it could not be done, as probably the individual would have been summoned for creating a smoke nuisance.

Now what is to be done in a case of this kind?

Property and householders are greatly handicapped by theoretical *sanitary* improvements, and it would greatly simplify matters if corporations and urban councils would supply each householder and tenant with proper printed instructions as to how they require the refuse to be divided, and how disposed of and how often the bins and refuse will be removed.

*Theoretically.*—I am in favour of bins.

*Practically.*—Undoubtedly give me the covered ashpit.

Cleanliness.

### The English Memorial to the Late King in Berlin.

Sir,—The English colony in the capital of Germania are proposing to place in the vestibule of the Rathaus a bust of his late Majesty King Edward VII. It will be from the hand of Professor Oscar Alexander Young, who has been *persona grata* in the Germanic artistic centre since the Drei Kaizer Jahr (circa 1888); he is, by the way, a grandson of Captain Robert Benjamin Young, H.M.S. *Entreprenante* (cutter), which was at the battle of Trafalgar.—Yours, &c.,

The Britannic Atelier, L. Davis, Lieut. R.N.
Kensal Green, W.: June 14, 1910.

## GENERAL.

The British Government has decided to build new legation houses at Mexico and Sofia, at a cost of between 22,000*l.* and 23,000*l.* each.

Mr. S. Segar, architect, has prepared plans for a new wing to the workhouse infirmary at Newton Abbot to accommodate 60 patients. The plans have been approved by the Guardians, and will be submitted to the Local Government Board.

A new museum is to be erected in Broad Street, Spalding, for the Spalding Gentlemen's Society, one of the oldest antiquarian societies in the kingdom. There will be a museum on the ground floor, and a spacious library on the first floor. The cost is estimated at 1,500*l.*

The number of visitors to the Horniman Museum at Forest Hill, London, S.E., last year totalled 207,304, an increase of 16,465 compared with the previous year. The London County Council have accepted an offer made by Mr. E. J. Horniman, son of the late founder, to provide a lecture hall and library, at a cost of about 4,500*l.* The hours of opening the museum have been re-arranged on the lines of the daylight saving system. On week-days between October and March, three hours of daylight have been substituted for three hours of artificial light; and during the other six months three hours of daylight take the place of one hour of (mainly) artificial light. The change has been appreciated by the public, as shown by increased attendances.

The Heriot-Watt College committee of George Heriot's Trust recommend the Trust cordially to co-operate with the College of Art, Edinburgh, in the institution of a diploma in architecture, and to institute day classes suitable for architectural students in mathematics, mechanics, descriptive geometry, geometric drawing, graphic statics, and mechanics of structures, the students to attend the evening classes in building construction and the allied subjects. It was explained to the committee that the teaching can be undertaken by the existing engineering staff, with the exception that it will involve the appointment of an additional assistant in the mechanical engineering department, with a knowledge of architectural engineering, to devote his time from 8 to 11 A.M. to the teaching of architectural students, and in the later hours of the day to assist generally under Professor Stanfield. The salary for this post was fixed at 150*l.*, and the clerk was directed to communicate with the Scotch Education Department for approval before making any appointment.

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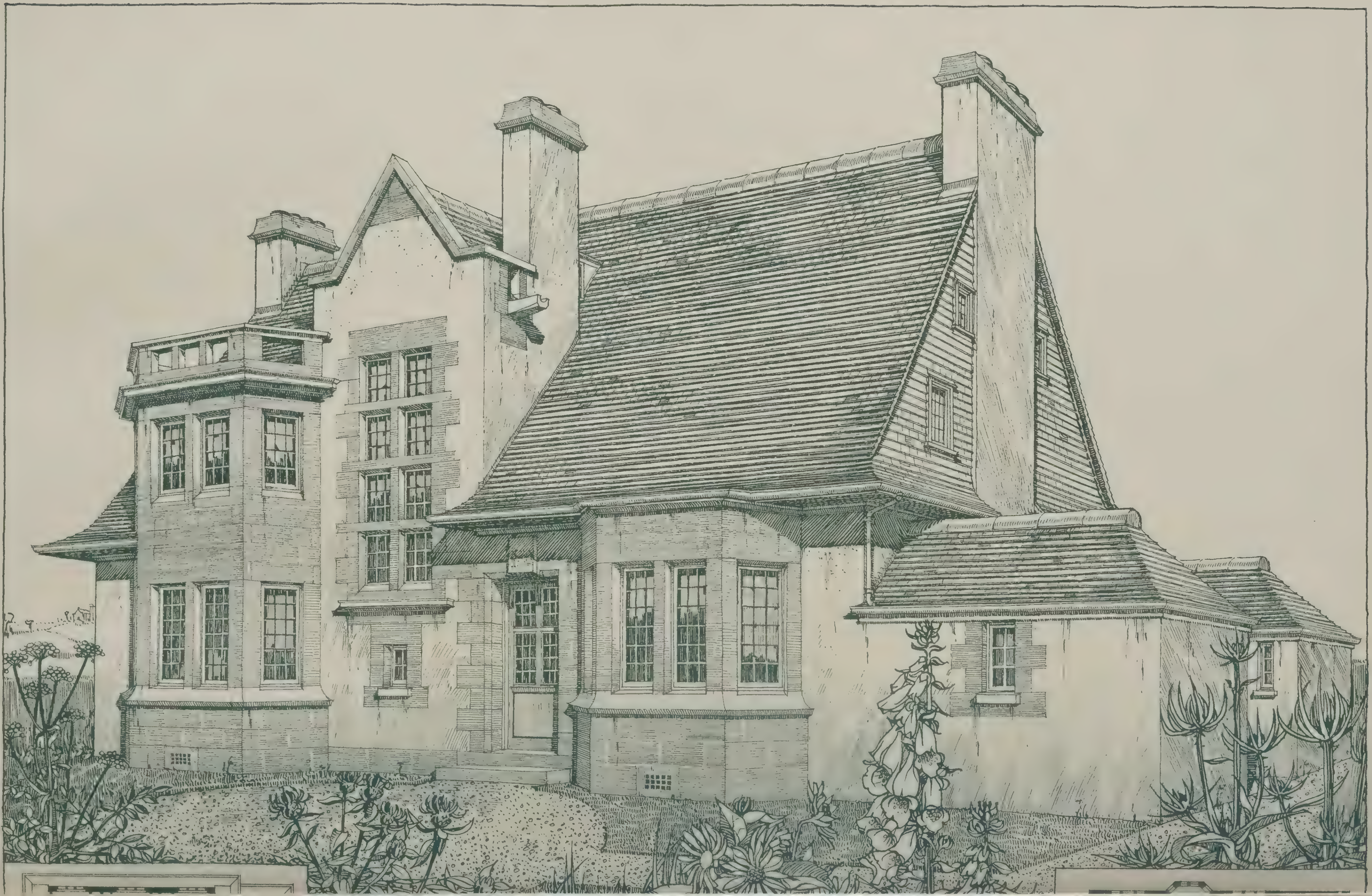
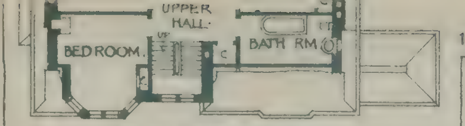
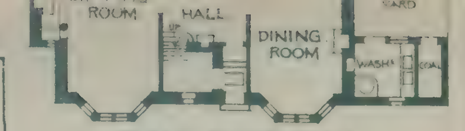




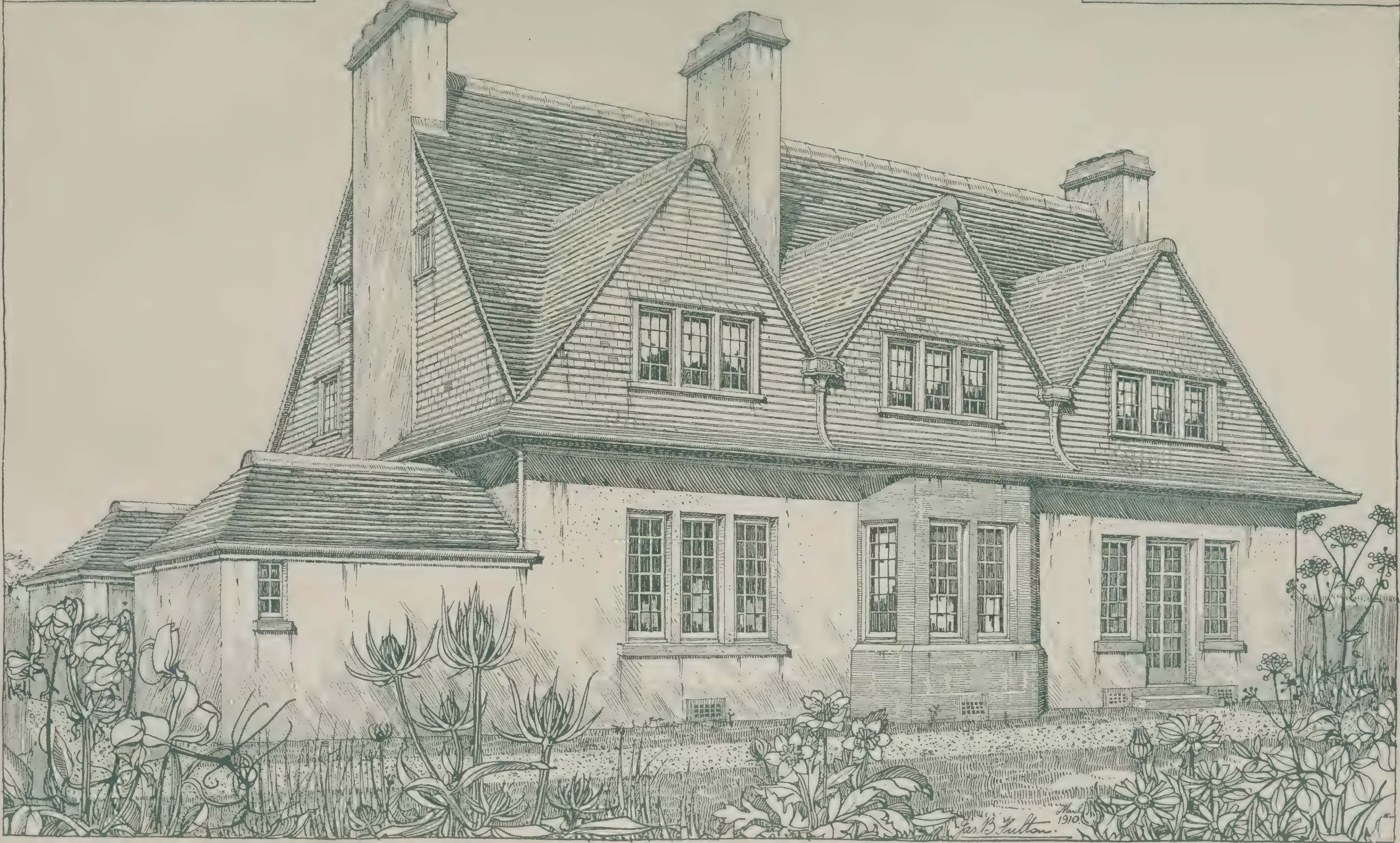
FIRST FLOOR PLAN.

1909 - 1910.

JAS. B. FULTON ·A·R·I·B·A· ARCHITECT.
14, BEDFORD ROW. LONDON. W.C.



GROUND FLOOR PLAN.


Jas. B. Fulton.
March 1910.

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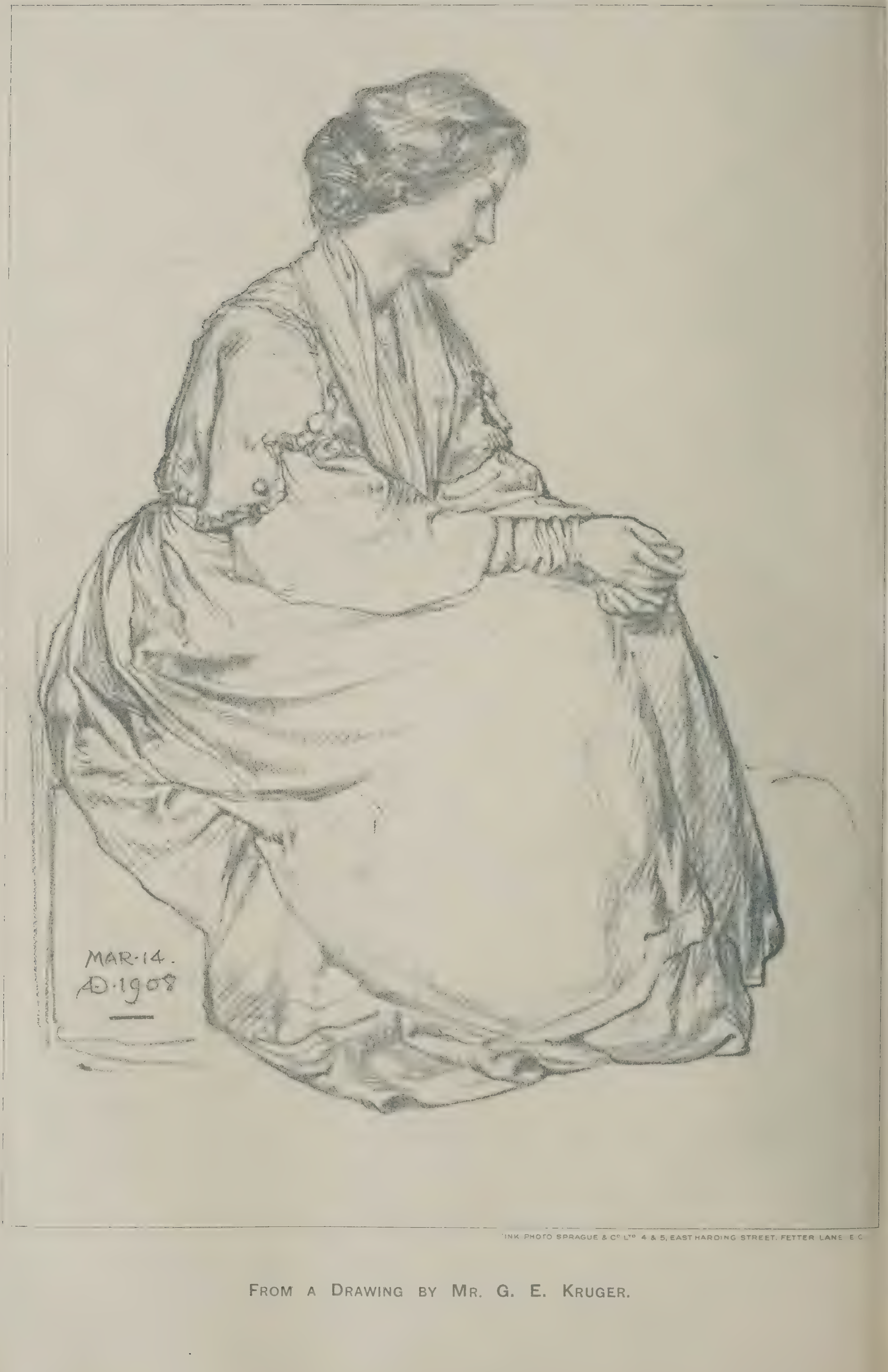

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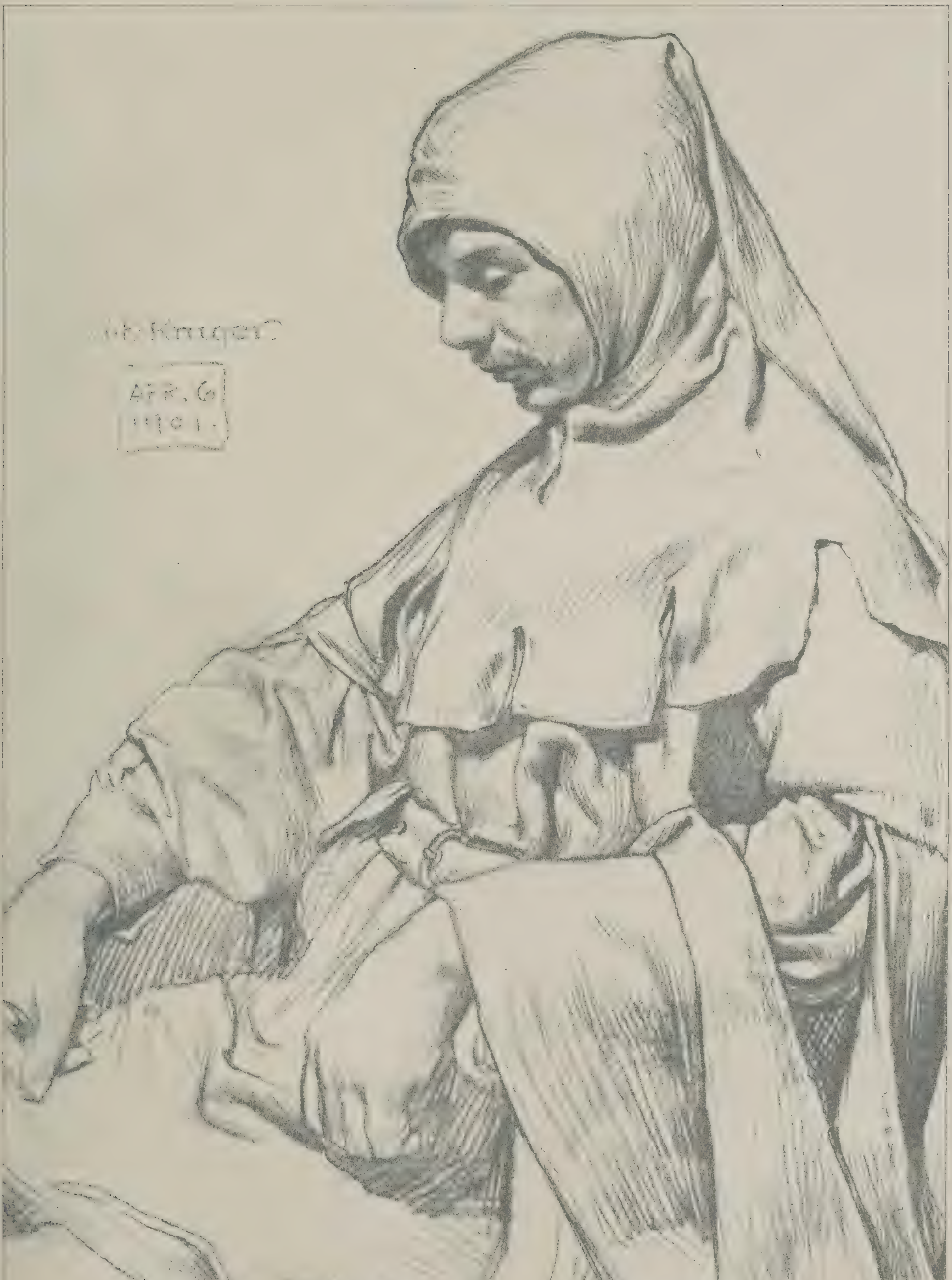
FROM A DRAWING BY MR. G. E. KRUGER.

The Architect, June 17th 1910.



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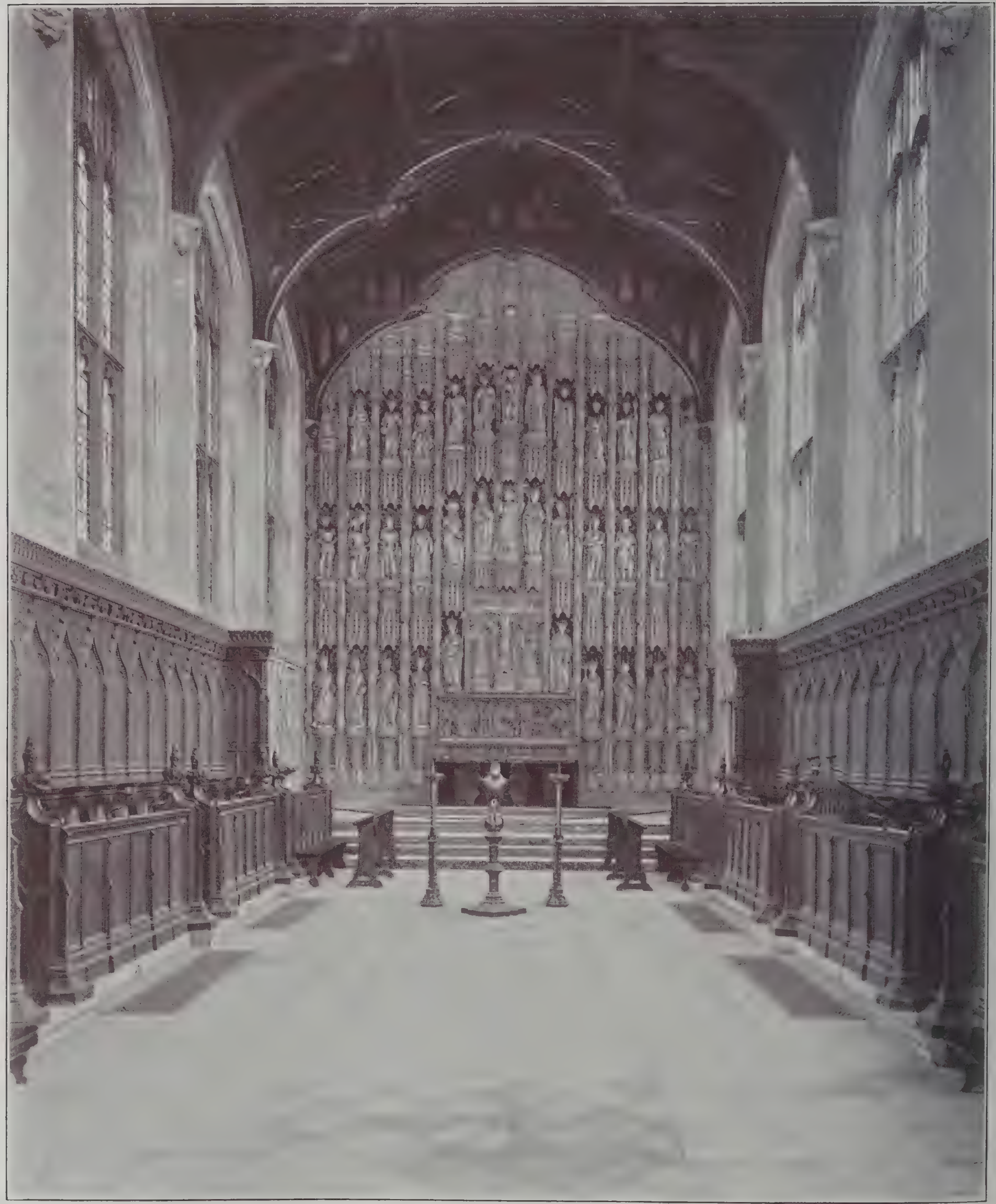

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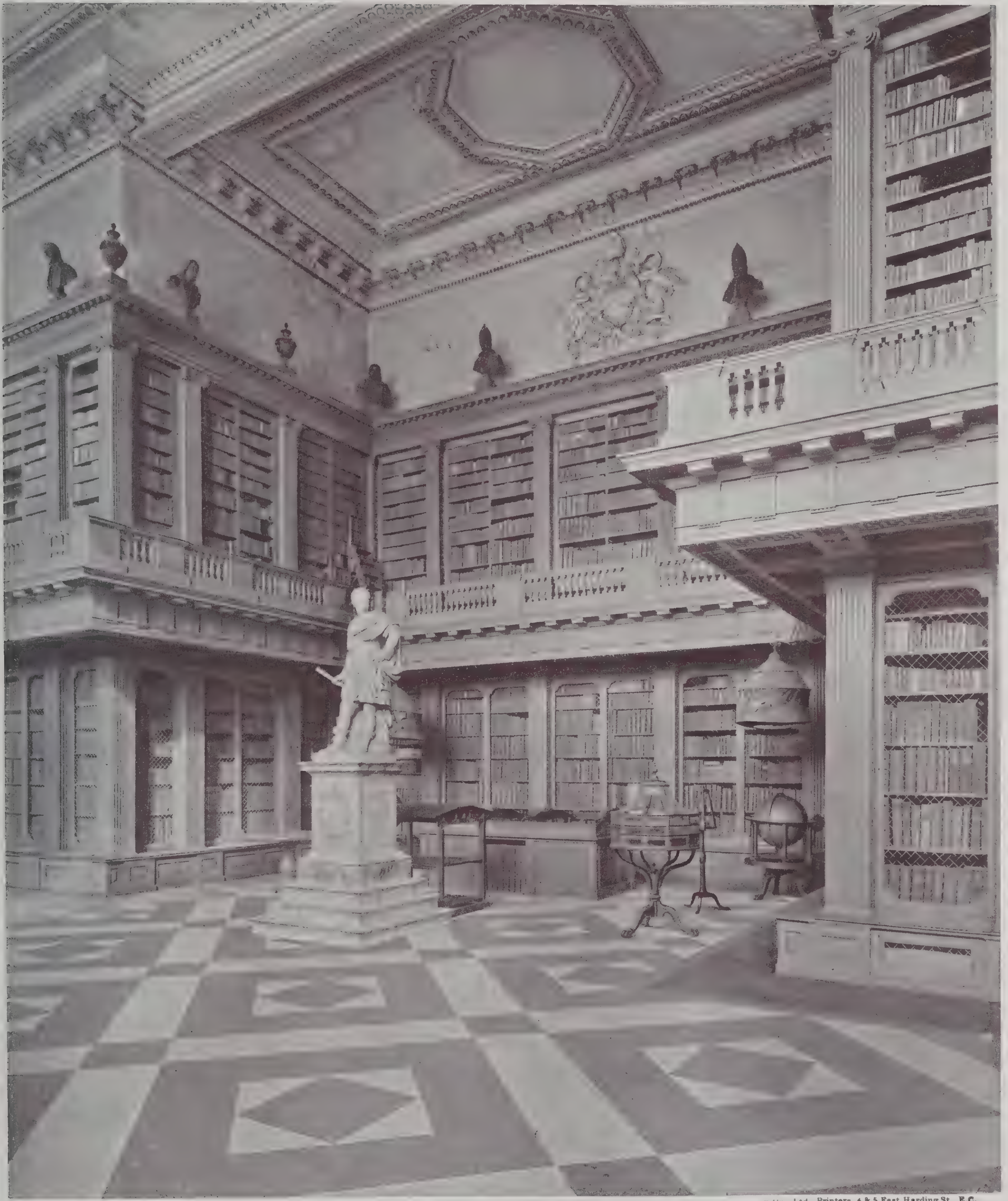

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# The Architect.

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## FORTHCOMING EVENTS.

*Saturday, June* 25.

Royal Sanitary Institute : Provincial Sessional Meeting at Dublin. Second Day.

Edinburgh Architectural Association : Visit to Gullane.

*Wednesday, June* 29.

Rural District Councils' Association : Annual Meeting at Caxton Hall, Westminster, S.W.

*Tuesday, July* 5.

Royal Society of Antiquaries of Ireland : Summer Meeting at Douglas, Isle of Man. Closes July 8.

*Thursday, July* 7.

Society of Architects : Visit to Messrs. Ingham, Clark & Co.'s Works, West Ham.

## CITY OF EDINBURGH.

### NEW MARKETS AND SLAUGHTERHOUSES.

An important addition to the number of modern abattoirs and cattle markets in Great Britain has been made by the opening yesterday of new Markets and Slaughterhouses for the City of Edinburgh. For sixty years the Corporation of Edinburgh has had the monopoly of slaughterhouses under the provisions of the Edinburgh Slaughterhouses Act, 1850, but the slaughterhouses erected in consequence of this Act were not merely at a distance from the markets, but were in a crowded part of the city, and their removal has for many years past been recognised as essential to the improvement of the district and the adjoining area of the canal. The markets also were at a distance from a railway station, and had the further disadvantage of being scattered in different parts of the city.

It was obviously desirable to get a site upon which the cattle markets, the auction marts, the slaughterhouses, the corn market, and the allied trades, which are more or less dependent upon the frequenters of these, could be concentrated and situated conveniently near a railway station, on both railways, with access by tramways to the city. There was great difficulty in obtaining a site possessing these requisites, but at length, in 1901, certain lands at Gorgie were acquired by the Town Council as Governors of Trinity Hospital, and in the following year the Town Council resolved to feu these lands from the Governors of Trinity Hospital and to establish the markets and slaughterhouses upon a portion thereof, a site of about 25 acres in extent.

The scheme includes (1) the slaughterhouses, (2) the building of the St. Cuthbert's Co-operative Association, in connection with the butcher-meat or flesh department of their business, which is an extensive one; (3) the Corporation cattle market and accommodation connected with it; (4) ground reserved for future extension and for implement stands or miscellaneous purposes; (5) a restaurant, with access roads on the north and south sides, leading to the cattle market in the rear; (6) the corn market, with a wide roadway to the north, separating the markets from the auction marts; (7) the extensive buildings forming the auction marts of Messrs. John Swan & Sons, Ltd., and Messrs. Oliver & Son, Ltd.; and (8) ground reserved in the meantime, and roads connecting the Corporation markets with the private sidings and loading banks which are in course of formation on the east side of Chesser Avenue, connecting by private railway with the North British Railway at Gorgie.

The cost of the new buildings may be approximately stated as follows :—

| | £ | s. | d. |
|---|---|---|---|
| Cattle Market . . . . . . . | £30,000 | 0 | 0 |
| Corn Market . . . . . . . . | 12,000 | 0 | 0 |
| Slaughterhouses . . . . . . . | 50,000 | 0 | 0 |
| Restaurant . . . . . . . . | 7,500 | 0 | 0 |
| Chesser Avenue and Bridges . . . . | 7,000 | 0 | 0 |
| Railway Sidings . . . . . . . | 20,000 | 0 | 0 |
| Electric Tramway . . . . . . . | 12,000 | 0 | 0 |
| | £138,500 | 0 | 0 |

The buildings, so far as erected by the Corporation, have been carried out to plans prepared by Mr. James A. Williamson, A.R.I.B.A. The drainage arrangements in the feuing roads have been made by Mr. J. Walker Smith, the Burgh engineer; and the construction of the roads has been carried out by Mr. James Sim, City Road Surveyor.

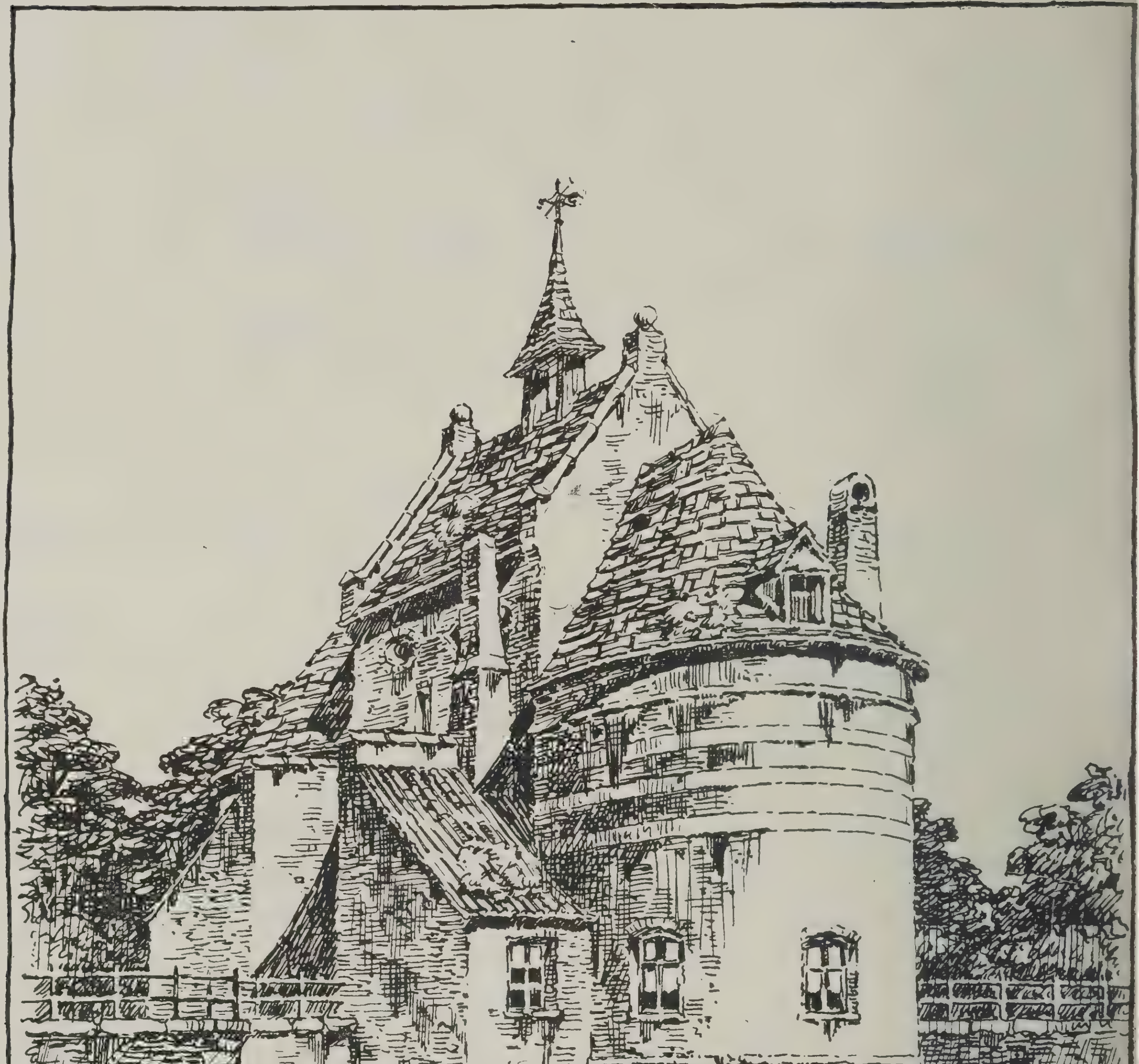
The slaughterhouses occupy the southmost of the various sites, and have along the south side the main line of the Caledonian Railway Company. In levelling the ground for the site it was formed at a higher level than the remainder of the areas by about nine feet, thus ensuring exposure to the fresh breezes from the west.

With a view to embodying the latest ideas in abattoir planning, the Corporation appointed a deputation to visit the Continent, and this deputation on its return presented a valuable and interesting report on the whole subject.

The buildings and appliances which are appropriate in Continental cities require considerable modification to meet local customs and circumstances. The new slaughterhouse buildings therefore, as now built, have been arranged and equipped to meet the views of the master butchers of Edinburgh, and it is believed they will efficiently meet the requirements of the trade. They have been constructed on clean and sanitary lines, with a thoroughly efficient system of drainage and water supplies, and are fitted up with the best type of machinery and appliances available. Ample ground has been reserved for future extensions, and the grounds have been laid out with grass plots, trees, and shrubbery by the City Gardener.

The constituent buildings comprise the following :—Entrance lodge, superintendent's lodge, lodges for gatekeepers, killing and cooling halls for large cattle, pig-slaughter hall, sheep-slaughter hall, tripery, dung house, fat searching house, boiler house, premises for condemned meat plant, &c., and premises for the treatment of blood, gut, and fearns.

In addition there are restaurants and recreation rooms for male and female workers, and there is at present in course of construction a block of buildings intended for


J. GREY WEST.
12·8·08.

AT BRUGES.—From a Sketch by Mr. J. GREY WEST.

the teaching of meat inspection to veterinary and other students, including lecture theatre, bacteriological laboratory, professors' retiring room, place for the detention of diseased carcases, and the dressing of fallen animals.

Private buildings have been erected by several hide, skin, and tallow companies and others.

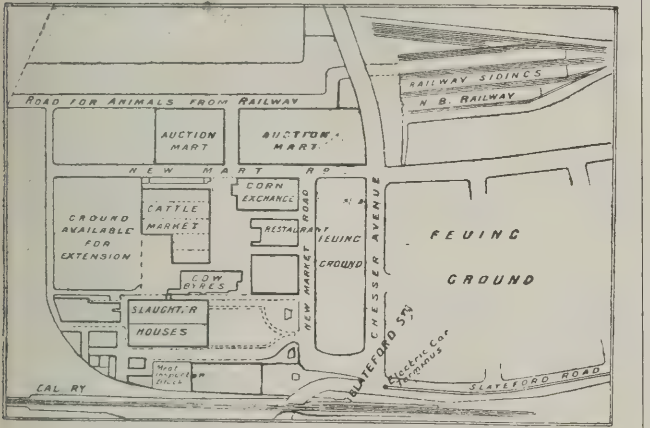
The whole of the buildings are built of brick of good facing quality, with dados on the exterior walls of salt-glazed bricks for cleanliness. All salient and re-entrant angles are formed of rounded or hollow bricks, or tiles, &c., right-angled junctions of walls and ceilings and floors being thus avoided. The roofs of the slaughter halls are of ferro-concrete. The large slaughter hall is a building 300 feet long by 80 feet wide, divided lengthwise to form slaughtering and cooling halls.

The slaughter hall is divided longitudinally into fifteen spaces of 20 feet each, thus giving room for two killers in each, or thirty in all. The spaces are separated from each other by ferro-concrete and tiled partitions about 7 feet high, and the level of the top of these partitions is carried round all the walls of the hall as a tiled dado.

The hall is lighted along its whole length by patent glazing, resting on louvred lanterns. Windows are also placed along both walls, those on the south side of the slaughter hall being clerestory lights, formed above the roof of cooling hall, the latter being at a lower elevation than the slaughter hall.

Corresponding in length, and in the rear of the slaughter hall, are the pennages for cattle and sheep. These are of iron, and are covered with steel roofing and heavy corrugated sheeting. The lighting is by patent glazing on upright louvred lanterns.

The cooling hall has the walls tiled the whole height, and is top-lighted on the north only. The hall is furnished with cubicles of vertical iron grilles nine feet in height, to contain the dressed carcases. These cubicles will be 10 feet by 15 feet, each having a self-locking sliding gate, and will be allocated to the master butchers as required.



Block Plan of Markets, &c., Edinburgh.

The pig slaughter hall consists of a sub-division into pennage for the animals, space for slaughtering (which will take place on a bench about 2 feet 6 inches above the floor level), and hanging. The carcase is lifted by means of an iron gate or grille on the bench, and discharged into one of the seven scalding tanks with which the building has been fitted; from thence, after plotting, the carcase will be drawn on to scuttling tables, and thereafter will be treated and dressed.

The roof of the slaughter hall is kept higher than the hanging space to permit of the steam and vapour escaping from the plotting tanks being carried off without penetrating the latter. The construction and lighting is similar to the large animals' hall. The centre part of the hall is furnished with overhead tracking.

The sheep slaughter hall is in most respects similar in construction to the former, there being the usual lairage for the animals, and the slaughtering and hanging hall. Both buildings are specially fitted up for hanging the carcases after slaughter.

The large killing hall is fitted up with an extensive system of overhead railways or tracking, which conveys the carcase after being dressed into the cooling cubicles and thence outside to the front of the cooling hall, where it is lowered by special lowering gear into the vans, lorries, &c. The overhead tracking couples up the other slaughter halls, and will ultimately be taken to cold storage and the meat-teaching block. The tracking is what is known as the twin-bar type, the carrying hooks being suspended to broad flanged carriers or trollies with ball bearings. There are fixed junction points, thus permitting the load to be conveyed to any part of the premises desired. The cost of this installation, including relative plant and machinery, is over 7,000*l*.

From the boiler house, which is fitted with a double-flued Lancashire steam boiler, hot water is generated and supplied to all the buildings. This plant will cost about 1,200*l*.

Where carcases are unloaded there are projecting verandahs, and in conveying carcases to the various parts of the premises the tracking and machinery is covered by glass verandahs.

The tripery is a large, well-lighted building, fitted with all the most modern appliances for the preparation of tripe, &c. It is arranged so that the material is received at one end, and after going through the various processes is turned out as a finished article at the further end and stored in water in large white enamelled storage tanks previous to delivery to the master butchers.

The new cattle market covers an area twice as large as the present market in Lauriston Place. This gives an area of about 4½ acres, but ground has been reserved by which other 3½ acres can be added as business increases.

The constituent buildings are:—(1) Markets and slaughterhouse superintendent's office; (2) cattle and sheep pennage; (3) milch-cow byres for 240 animals; (4) auction sale ring; (5) premises for dealing with milk; (6) sheep dipping bath, foot bath and lairage in connection therewith; (7) premises for generating hot water, &c.; (8) licensed drovers' shelter; (9) office and lavatories, &c.; (10) three implement halls.

The cattle and sheep pennage covers a space of about 7,000 square yards and provides for 800 head of cattle and 6,000 sheep. This space has been roofed over with steel roofing, corrugated sheeting, and patent glazing, at a cost of 12,000*l*. The remainder of the space for the exhibition and sale of cattle is in the open, with pennage at certain parts.

The milch-cow byres have been constructed on very complete lines, the exterior walls having a glazed brick dado for cleanliness, the remainder of the walls being of brick and stone dressings with rough-casting. The hall is 174 feet in length by 80 feet in width.

The roofs are of steel and slated. Both top and side lighting have been introduced, the former being by upright lanterns and patent puttyless glazing. Ventilation has been specially considered, and steam heating has been arranged controlling the building in sections, so that the temperature can be regulated and adjusted to suit the varying number of cattle housed in the building. This arrangement is considered of great importance in the case of milch-cows, which are more delicate in their constitution than other classes of cattle.

The sale ring is at the east end of the byre and connected thereto. It is staged for the buyers, having a stout fence next the ring. The building is top lighted, is lined with glazed bricks, and is fitted with a rostrum for the auctioneers.

Adjoining is an office for the dealers, having suitable lavatory accommodation.

The corn market, which is situated at the corner of New Market Road and New Marts Road, is conveniently placed to permit of the business being carried on in conjunction with the cattle market, which adjoins in the rear.

It is a stone-built structure, the front entrance being approached by means of a handsome loggia of Doric columns.

The building covers a little less than an acre of ground, the extreme dimensions being 245 feet by 123.6

feet. The exchange hall is 165 feet by 92 feet 6 inches, and has a range of offices down each side and at one end. Stalls for merchants are placed along the walls.

There are a large settling and business room, and a room of corresponding size for trade meetings. Four branch banks also abut on the entrance corridors.

At the north-west corner there will be a postal telegraph office, access to which can be gained both from the corn market hall and from the outside.

At the south-west corner will be a series of telephone call offices, working through an internal branch exchange, which will give very ample telephone facilities to all parts of the markets, as well as to the Central Telephone Exchange.

The hall has been arranged to give ample lighting, so that the inspection of sample grain may be facilitated. It is heated by means of steam radiators served from a steam boiler in the basement.

## NOTES AND COMMENTS.

THE Corporation of Glasgow, in pursuit of their laudable efforts to promote smoke-abatement in their city, are arranging to hold, from September 16 to October 8 next, an exhibition of the latest and most scientific devices in connection with smokeless heating and lighting, embracing the most up-to-date methods and contrivances for the complete combustion of fuel, as well as the most modern developments in heating, lighting, and ventilation by means of gas and electricity.

THIS method of education is pleasanter and goes further than the prosecution of offenders against the existing law, which is not altogether adequate for effective smoke-abatement. With respect to such prosecutions in Glasgow Mr. PETER FYFE, the chief Sanitary Inspector for Glasgow, states in his report for 1909 that convictions were obtained in forty-eight prosecutions, the average fines for first offences being 11*s*. 3*d*. and for second and subsequent offences 31*s*. 8*d*. The improvement in the factory chimneys previously referred to had been fully maintained during 1909. Eighty-six improvements were effected in furnaces, and in twenty-six of the cases these consisted of the application of mechanical stokers in lieu of hand firing. Considerable complaint was made by citizens as to the nuisance caused by the heating of tar and asphalte in the public streets. Much carelessness on the part of the men in charge, in conjunction with the persistent use of coal in the furnaces, was the main cause of the nuisance. As a result of the Sub-Committee on Air Purification conferring with the heads of departments, particularly as to the desirability of burning gas coke, a considerable diminution had been effected in the smoke produced.

WE regret to have to announce the decease of Mr. T. J. BAILEY, who, only at the end of last year, retired from the position he had held for many years as architect to London's educational authority, originally the School Board for London and latterly the London County Council. Mr. BAILEY had brought the adopted type of London's elementary schools, the central hall system, to as near perfection as seemed possible, and he has enriched London with many examples of excellent architectural design.

THOSE British delegates who, under the auspices of the National Housing and Town Planning Council, took part in the ninth International Housing Congress in Vienna, found the Congress in favour of the general acceptance of the principle that municipalities should undertake the building of dwellings for the working classes in default of adequate provision by private enterprise. The Englishmen stoutly upheld the superiority of the cottage type to the block of flats, and in this were supported by Professor FUCHS, of Tübingen, who has himself seen what is effected in our own country in this direction and its influence on the family life of the artisan. It was, however, admitted by Mr. T. H. MAWSON that the block building helps to make a city, whilst the cottage restricts a town of any size to the character of a village.

THE grand manner in town planning is, we fancy, impossible of maintenance in Great Britain. The exigencies of modern improvement will never be allowed to remain unsatisfied, because they interfere with something that has been done in the past more or less architecturally impressive. Of this fact the action of the Governors of GEORGE HERIOT'S Trust in Edinburgh affords an illustration. In connection with the plans of alterations proposed to be made by the Edinburgh School of Cookery and Domestic Economy on the property Nos. 3 to 6 Atholl Crescent, the Clerk intimated that the Cockburn Association had requested the Governors to receive a deputation from the Association. It was agreed to receive the deputation, who consisted of Professor BALDWIN BROWN, Mr. JAMES BRUCE, Mr. ADAM SMAIL, and Mr. GEORGE J. WOOD. Professor BALDWIN BROWN said the older buildings in the central part of the town were under the protection of the Town Council, and the Association considered that the examples of neo-Classic architecture in which the city was so rich were just as important in their way as were the older buildings. He emphasised the fact that the design of the buildings in Atholl Crescent was complete, each part balancing with another, and said it stood to reason if they altered the proportions, if they thrust out an excrescence or altered the sky-line, they would destroy the effect of the whole. The thrusting out of the large portico seemed to the Association to be an architectural enormity, especially as there did not seem to be any special use for it. The addition of an attic storey would break the sky-line. Everybody had the greatest sympathy with the work of the School of Cookery. All one wished was that it could be in a situation where it would be able to expand as it desired. It was urged that the application should be granted on account of the good educational work done by the institution. That introduced rather a dangerous principle in regard to the conduct of public affairs, which might open the door in the future to a good deal which was very carefully and scrupulously avoided by Parliamentary Committees. They asked the Governors even at the eleventh hour to step in and save that conspicuous monument of the great modern period of Edinburgh architecture. The Governors, in spite of this protest, resolved to confirm their approval of the plans of the proposed alterations, with the exception of the portico, the suggestion for which had been deleted from the design.

MR. T. C. HORSFALL, in a letter to the *Manchester Guardian*, well points out the mistake that is being made in the starving of the Art Gallery Committee by the Town Council when he says:—"Art is for Manchester not a luxury. It is unquestionably a necessary of health, because only by the help of art will it be possible to displace the drinking and gambling which are ruining us, body and soul, by modes of spending leisure time which will really re-create our almost exhausted powers. Every attractive picture, every attractive work of art of whatever kind, which the Art Gallery Committee buys and places where it can be easily reached by the mass of the people will do something to keep down the rates and to restore to the community the intelligence and the vigour of body and mind which will enable it to pay its rates."

PROFESSOR GARSTANG, of Liverpool University, has last winter made some remarkable and interesting discoveries on the site of Meröe, the ancient capital of Ethiopia. He has unearthed the remains of the famous temple of Ammon and the temple of the Sun, with the wonderful table mentioned by HERODOTUS. Although rifling had occurred a few very beautiful jewels were discovered, and the Professor was able to correct some of the inaccurate descriptions of the Ethiopians given by HERODOTUS.

THE offer of Mr. WILLIAM BANKS to bear the cost of erecting a crown on the Old Steeple of Dundee has been accepted by the Town Council in response to the following

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letter from Mr. BANKS's solicitors, which explains the matter clearly:—"As you are doubtless aware, about the year 1873, when the Old Steeple was restored, there was a proposal that the tower should have a crown placed upon it, and the architect, Sir GILBERT SCOTT, drew a design for such a crown, photographs of the south-east view of which exist. The proposal to place the crown upon the tower was departed from at that time, but it has been raised on more than one occasion. We are now instructed by our client, Mr. WILLIAM BANKS, 3 Hyndford Street, to approach the Town Council, and make an offer that if the Town Council will carry out the crowning of the steeple, Mr. BANKS will provide the funds necessary for the purpose up to 2,500*l.*, which was the sum the late Sir GILBERT SCOTT estimated would be required to carry out his design, and which estimate has recently been confirmed to Mr. BANKS by Mr. J. OLDRID SCOTT, architect, London, Sir GILBERT SCOTT's son, who is familiar with the whole matter. On hearing that the Town Council are agreeable to the proposition and to the work being proceeded with forthwith, Mr. BANKS will furnish you with a letter of obligation from the Commercial Bank, Dundee, undertaking to provide the necessary funds up to 2,500*l.* for the work. Our client understands that your Council would employ Mr. SCOTT as architect to carry out the work."

FROM the *Dundee Advertiser* we learn that, from time to time during the past few years, much has been done for the preservation of the existing ruins of Balmerino Abbey, and extensive excavations have laid bare much of the foundations of the walls and piers of the choir, transepts, and nave of the church. The whole edifice was about 206 feet in length within the walls—a few feet longer, though of less width, than St. Giles's Cathedral, Edinburgh. These operations have been carried out by the Hon. MORTON G. STUART GRAY, proprietor of Balmerino—now Earl of MORAY—under the advice and superintendence of Mr. F. W. DEAS, F.R.I.B.A., Edinburgh. Among other things, it may be mentioned that the double doorway in the west front of the nave, which was formerly hidden by mounds of earth, has been opened up, and also a smaller doorway leading from the cloister through the west wall of the north transept. The chief portions of the existing buildings are the chapter-house, with its piers and partly vaulted roof; on its south side a vaulted apartment—the sacristy—and its doorway leading into the church; and on the north side of the chapter-house another vaulted apartment, which was evidently the slype, or entrance into the cloister.

## NOTES ON BOOKS.

"Simple Jewellery: a Practical Handbook dealing with certain Elementary Methods of Design and Construction, written for the use of Craftsmen, Designers, Students, and Teachers." By R. Ll. B. Rathbone. (London: Constable & Co., Ltd. 6*s.* net.)

WE have read with pleasure Mr. Rathbone's informative articles on "The Artistic Training of a Jeweller" and the processes of simple jewellery work in the *Art Journal*, and are glad to have them before us in book form with additional matter and illustrations, thus producing a manual of instruction both in craftsmanship and in design of simple jewellery which is useful for the young professional jeweller as well as for the amateur who would make a hobby of jewellery work. True that the author's teaching does not take the student very far beyond the limits of filigree work, but at least he gives some idea of the infinite variety of beauty that can be attained by the use of simple elements of wire and grains. The illustrations are combines of designs by the author and examples of old work, and the points in the teaching are elucidated by reference to both old and new examples.

The technical processes of handicraft and the tools required in the making of simple jewellery are clearly explained, and so far as such processes can be taught from a book without personal instruction we fancy that a careful study of the author's words, combined with patience in the practice of his precepts would enable any enthusiast to attain a considerable amount of skill in the fascinating craft of simple jewellery.

"Stresses in Masonry." By Herbert Chatley, B.Sc. (Engineering). (London: Charles Griffin & Co., Ltd. 3*s.* 6*d.* net.)

The study of stresses in masonry has been very generally neglected, chiefly by reason of the superabundant mass of material that considerations of æsthetic fitness and exclusion of weather have led architects and builders to observe until the regulation of sizes has become traditional rather than scientific.

Hence the remarkable discrepancy that has arisen between the attention that has been given and the books that have been written on stresses in steel or even timber and those in stone. It does, however, sometimes occur even in masonry that the stresses in a column, a corbel, or an arch approach within measurable distance to the theoretically safe stress, and hence Professor Chatley has done good service to the architectural student in providing this little book which clearly explains the stresses that may occur in masonry and the methods of calculating them. The student will find that there are many important points that have not occurred or been previously pointed out to him, as for example the greater importance of the shearing stress in stone columns beyond the direct compression. Every architectural student therefore should read Professor Chatley's book.

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"Papers of the Paint and Varnish Society, 1908-1909." Edited by the Secretary.

The papers read before the Paint and Varnish Society are full of valuable information and though some necessarily deal with the manufacture of painter's materials, there is much that is useful to the architect in helping him to a knowledge of the practical working of paint and varnish, materials that are perhaps more difficult of supervision than any others with which we have to deal. We should advise every architect to get a copy of this useful book.

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"The Sketcher's Oil Colour Manual (Oil Colour Technique)." By H. Macbeth-Raeburn. (London: Winsor & Newton, Ltd. 1*s.*)

This is one of Messrs. Winsor & Newton's shilling handbooks on art, and whilst it can scarcely teach the whole or any large part of the technique of oil painting it contains useful hints for the guidance of the amateur or the novice. The greater part of the book is in the form of an alphabetical guide to the nature of the various pigments ordinarily used and of the mixture of pigments that may be employed to render the appearance of definite objects, but reliance on such directions must be tempered by the author's advice to the student to "paint masses of colour and form as they appear to him."

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"Engineering Construction in Steel and Timber." By William Henry Warren. Second edition. (London: Longmans, Green & Co. 18*s.* net.)

During the fifteen years that have elapsed since the publication of the first edition of Professor Warren's book on "Engineering Construction in Iron, Steel, and Timber," great advances have been made in the science of testing materials and in the accumulation of an enormous amount of data on the physical properties of the materials of construction. Hence the second edition is considerably enlarged and partly re-written. American and Australian experience are brought into consideration, as well as the experiments and investigations of French and German authorities and British engineers and physicists. Thus we have brought before us a cosmopolitan field of view. Especially valuable are the modern results of experiments in the modifications in the limit of proportionality and the yield-point, caused by repeated stresses in steel.

The author's treatment of the subject of timber is largely based on experiments with American soft woods, and therefore British students must be careful in their adoption of the figures given, but the short account of seasoning and preservation is universally applicable.

Methods for the determination of the stresses in structures, the investigation of bending moments and shearing stresses, of influence lines and moments of resistance are well explained, and in connection with these the effects of unequal and variable loading are excellently expounded. The book being intended primarily for engineers, much space is devoted to problems of bridge design, but the chapters on the stresses in roof trusses, and the strength of columns would be valuable also for architects.

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"The Book of Decorative Furniture: Its Form, Colour, and History." By Edwin Foley, Fellow of the Institute of Designers. (London and Edinburgh: T. C. & E. C. Jack. To be issued in 17 parts at 2*s.* 6*d.* net each.)

A cheap book for the value that is given appears to be the book on decorative furniture, of which the first part has just been published by Messrs. Jack. The whole work is to contain reproductions of one hundred coloured sketches by the author and artist and one thousand illustrations in the text. The author states that in the colour illustrations he has aimed at "the happy mean between an insistence upon detail, so exacting as to destroy the real appearance of the example, and an impressionist sketch expressing details so vaguely as to be void of informative value." The same qualification applies also to the black and white illustrations, in which a somewhat conventionalised style of drawing is adopted, eliminating halftones.

The author's aim is clearly to give a general view of the subject of decorative furniture as developed throughout the ages from the earliest work of Assyrian and Egyptian civilisations to the beginning of the nineteenth century. His book is therefore suited for the general public rather than for the connoisseur who is concerned with the minute differences that distinguish the productions of schools and craftsmen closely allied in time. From this point of view the work seems admirably adapted to fulfil its purpose.

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"The Law and Practice of Rating and Assessment: a Handbook for Overseers, Members of Assessment Committees, Surveyors, and others interested in Rating and Valuation." By Clarence A. Webb, P.A.S.I. (London: Crosby Lockwood & Son. 7*s.* 6*d.* net.)

This book makes its appearance at an opportune moment, when quinquennial valuations for rating are troubling many owners of property, and owing to a very general depreciation during the last four years, differences of opinion between owners and assessment committees are of frequent occurrence. Although the primary basis of valuation for rating may seem simple, the subject really bristles with difficulties from the multiplicity of points determined more or less satisfactorily by an appalling volume of statute and case-made law, and as some guide is absolutely necessary for both owners and members of assessment committees, not usually selected for their expert acquaintance with law, we welcome so clear an exposition of the law and practice as is given by Mr. Webb.

The scheme of the book deals in separate parts with the law of rating, rating powers of local authorities, making and correction of valuation lists, and valuation for rating. A list is given of the numerous cases to which reference is made and an excellent index gives every opportunity for looking up any particular point. Although a careful study of the book will furnish the serious and professional student with a thorough grip of the law and practice of rating and assessment, the effect upon an inexpert owner of property must be, we think, to convince him of the intricacy of the subject and the desirability of obtaining expert assistance and guidance in his contest with an assessment committee.

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"Antiquity of Cremation." By Albert C. Freeman, M.S.A. (London: *Undertaker's Journal* Offices. 3*s.* 6*d.*)

If there are people, as Mr. Freeman suggests, who believe that the burning of the dead is a modern innovation, they will be convincingly shown to the contrary by this reprint of articles which have appeared in a trade paper. Instances are given of it from all quarters of the globe and from the heroic days of the Iliad. A check came with Christianity, for the doctrine of the resurrection of the body was prohibitive of cremation. However, Mr. Freeman contends that present-day graveyards are the darkest spots in the purity of our Christian profession of hope in death. "Can anyone imagine," he asks, "a more dreary and pagan practice, and a less beautiful and Christian custom, than the incessant repetition of the present burial symbols?" It is to be inferred that the author can only tolerate cremation. If this is so he does not advocate his views very forcibly, for the book is faithfully described by its title as "Antiquity of Cremation and Curious Funeral Customs." Many of the savage races, it appears, bury their dead, and generally to the accompaniment of much ceremony. The author covers a very wide range, and must have been at great pains to collect such a considerable amount of (rather loosely arranged) information.

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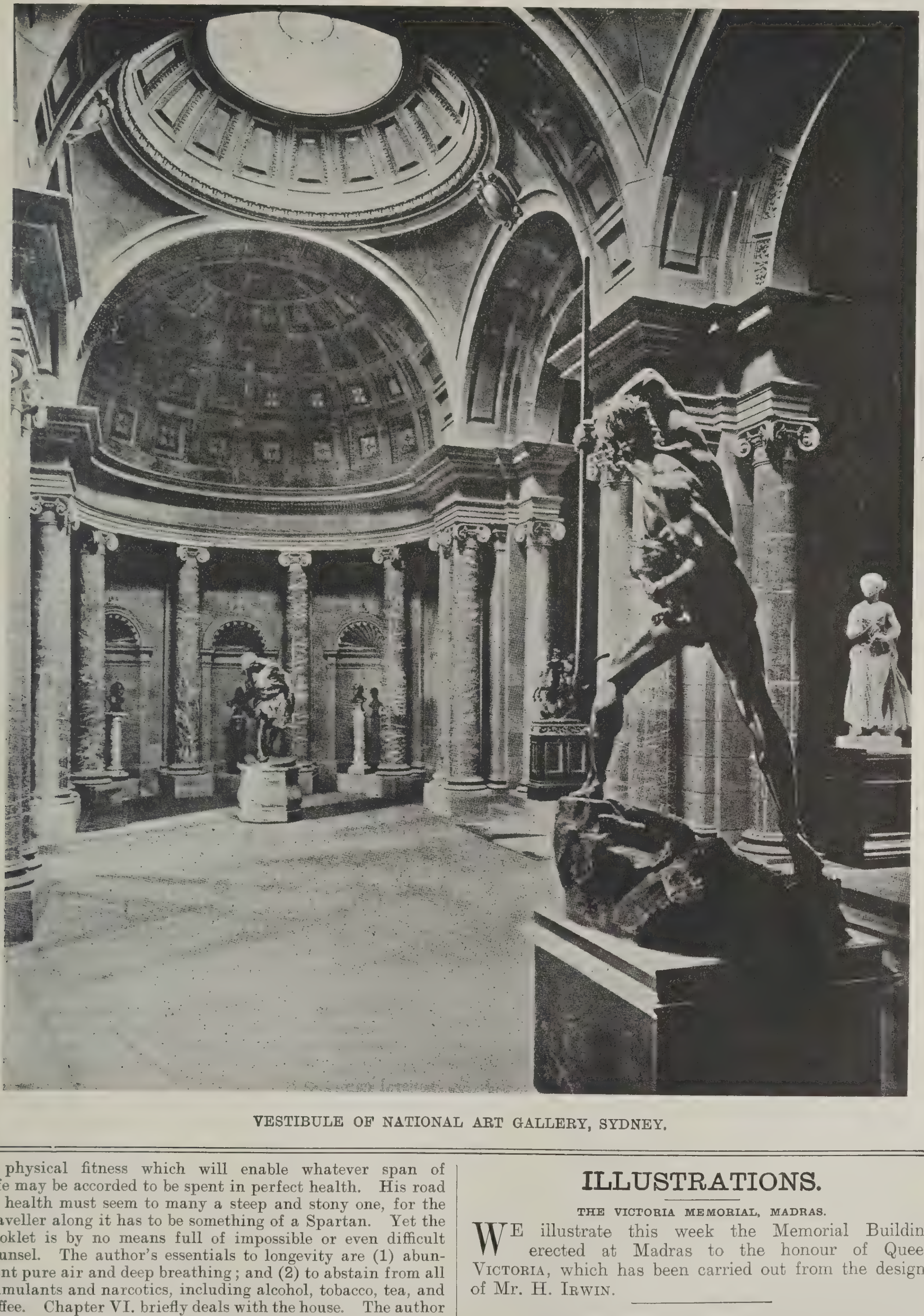
"How are You? The Problem of Health." By L. Henslowe. (London: John Long, Ltd. 6*d.*)

It used to be said that an ardent theorist who produced a book called "How to Live to be a Hundred" died very shortly after at the early age of thirty-five. Whether this be true or not, it brings out the fact that man may try as much as he likes to be master at all points of his destiny, and all to no purpose. But the author of "How are You?" explains that the object of his book is not primarily to produce longevity, but rather to produce



VESTIBULE OF NATIONAL ART GALLERY, SYDNEY.

a physical fitness which will enable whatever span of life may be accorded to be spent in perfect health. His road to health must seem to many a steep and stony one, for the traveller along it has to be something of a Spartan. Yet the booklet is by no means full of impossible or even difficult counsel. The author's essentials to longevity are (1) abundant pure air and deep breathing; and (2) to abstain from all stimulants and narcotics, including alcohol, tobacco, tea, and coffee. Chapter VI. briefly deals with the house. The author is quite justified in protesting against the small window and low ceiling too often found in the modern artistic dwelling. He would like to see the former replaced by French windows reaching from ground to ceiling; while the hall, dining-room, drawing-room, and breakfast-room of the small house are rolled into one good-sized apartment, furnished only with well-designed necessities. All this has been tried before, and successfully tried too; and the author will have the sympathy of most architects.

## ILLUSTRATIONS.

### THE VICTORIA MEMORIAL, MADRAS.

WE illustrate this week the Memorial Building erected at Madras to the honour of Queen VICTORIA, which has been carried out from the designs of Mr. H. IRWIN.

### BILLIARD ROOM, BRAMERTON, TULSE HILL.

THE billiard-room, which forms an additional wing to the residence of J. F. PERCIVAL, Esq., is built in brickwork faced with malms, the dressings being of Portland stone.

Internally the walls are panelled in oak to a height of 8 feet 6 inches, above which they are covered with pig-skin secured to grounds by large-headed brass nails arranged to form a simple design. The plaster ceiling was modelled by Mr. Gilbert Seale. The general contractors were Messrs. St. John & Sons, and the architects Messrs. Hall-Jones & Cummings.

### OXFORD COLLEGE SERIES, ALL SOULS.—QUAD, SHOWING RADCLIFFE LIBRARY.

THIS illustration completes our series of views of All Souls College.

### RADCLIFFE LIBRARY, OXFORD.

THE first stone of the Radcliffe Library, Oxford, was laid on June 16, 1737, and the building was opened with much ceremony in April 1749. Its founder was Dr. John Radcliffe, the remarkable English physician who was as indifferent to the feelings of royal patients as to those of anyone of the lower orders. He had gone to University College, Oxford, at the age of fifteen in 1665 and got an M.A. degree seven years later. He commenced practice as a doctor in the University town, and almost at once made himself prominent by the originality of his ideas and by his method of treatment, which was often directly opposed to the prevailing theories. He, however, was sometimes so startlingly successful that his reputation grew apace, and it was not long before he came to London, where he won high fame and fortune and from whence he finally fled in disgrace. He remained all his life an enthusiastic college man. He gave a considerable sum for the rebuilding of the inner quadrangle of University College, of which he had been senior scholar, and the work was completed in 1719. Queen Mary's statue is to be seen over the entrance gateway in High Street, and that of Dr. Radcliffe faces the quadrangle. But his greatest bequest was that of 40,000*l.* for the erection of the Radcliffe Library (first called the Physics Library), together with its endowment of 150*l.* per annum for a librarian, 100*l.* per annum for repairs, and 100*l.* per annum for the purchase of books. The work was not begun for some years after his death on account of the stipulation in his will that the building should not be proceeded with until his two sisters, to whom he had left generous annuities, had died. All the trustees were able to do in the interval was to purchase piecemeal such parts of the sites as had been mentioned by Dr. Radcliffe in his will.

A design was prepared by Hawkesmoor for the building, but it was never realised. The work was entrusted by the trustees to James Gibbs. About the time of its completion the architect brought out his "Bibliotheca Radcliviana" as a complete account of the library. The book is illustrated with twenty-three large copper plates by Foudrinier, and of these the text is descriptive. In his dedication to the trustees Gibbs says:—"I must in justice say that in all business of this sort in which I have been engaged I never observed a trust discharged with greater urbanity, integrity, and candour during the whole time I had the honour of serving you from the laying of the foundation stone of this fabric to its finishing. And all persons employed by you therein do honour you for your punctual payments and great diligence in seeing every part put in execution with honesty, economy, and equity. I wish you may be a pattern to posterity to follow your laudable example on any occasion of a like nature."

Fergusson thinks that Gibbs cannot be congratulated on his choice of a circular or domical form for the purposes of a library. But he adds that, if his employers were willing to sacrifice the lower storey wholly for the sake of giving height to the building, and if they approved of a form by which hardly more than half the possible accommodation was obtained, Gibbs perhaps was scarcely to blame for the choice made, seeing that it enabled him to produce one of the most striking and perhaps the most pleasing Classical buildings to be found in Oxford. Fergusson concludes by saying that its great fault is that nothing in the design in the least degree indicates the purpose to which it was to be applied, and that even after all the sacrifices had been made for effect Gibbs had to introduce two ranges of windows between the columns. He considers that the proportions of the whole are good, the details appropriate to the places and well drawn, so that the monument has a monumental and elegant look of which its architect might well be proud.

A more detailed account is given by Professor R. Blomfield in his "History of Renaissance Architecture in England." He says:—"The design consists of a great rotunda with a rusticated plinth, above which are sixteen piers of engaged Corinthian columns carrying a continuous entablature and a balustrade with pedestals and urns above the columns. The great sweep of the unbroken entablature and the genius of conception displayed throughout this building show Gibbs at his best had some of Wren's happy faculty of designing in the grand manner. Set back a distance of 17 feet 6 inches from this balustrade comes an upper circular storey which forms the drum of the dome. This storey has eight buttresses 5 feet thick, with a cornice pedestal and urns above the buttresses. . . . The buttresses to the drum of the dome come between the pedestals above the lower order instead of opposite them; a complete variation on conventional design fully justified in perspective. The general plan is exceedingly simple. An oval staircase reaches the first floor, and small newel staircases indicate that the galleries are run round the circular spaces beneath the dome. Gibbs's inferiority to Wren is evident in the interior of the building. The drum of the dome starts from an unbroken entablature on modillions, and the arcade under this entablature is circular in plan, with the result that the arches are inwinding and the mitres to the return to the entablature are violently exaggerated. Moreover, the pilasters to the drum are out of proportion to the small Ionic order of the arcade below; and Artari's plaster work is rococo and florid to the last degree. . . . Wren's influence is evident in the general design of the Radcliffe Library, and, in fact, it is very probable that Gibbs took his idea from Wren's design for the mausoleum of Charles I." The architect himself was apparently very proud of his building. In the "Bibliotheca Radcliviana" Gibbs thus describes the interior:—"Plate B is the plan of the library over the stone porch, consisting of two circles one within the other. The diameter of the inner circle, which supports the cupola, is 48 feet, but the extent of the diameter of the outward circle, against which the presses of the books are placed, is 83 feet 6 inches. When you stand in the centre of the room you see the bookcases through the seven great arches of the inward circle, which bookcases are curiously framed of right wainscot and their mouldings underneath carved. The room where they are placed is of a circular form, going from one round staircase to the other, 15 feet broad and 12 feet high, raised 6 inches above the floor of the middle circle and floored with right wainscot boards all laid to the centre of the building. Its ceiling is handsomely adorned with fretwork and the whole room lighted by seven windows. The floor of the middle circle is paved with Portland stone intermixed with red Swedish stone drawn from several centres." He says in another place that it was first proposed that the pavement should be in black and white marble, but this was rejected as being unsuitable, "because the air condensing, occasioned by its hardness, (which commonly, though improperly, is called sweting) it makes the place damp, especially where no fire is kept, and is fitter for churches, porticoes, common hall, and passages than a library."

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In the series of Church Art Handbooks which Henry Frowde is publishing, a second volume of "Wood Carvings in English Churches," by Mr. Francis Bond, is nearly ready; this deals with stallwork, chairs, and thrones. A third volume, for church charts, almeries, organ cases, doors, alms and collecting boxes, is in preparation by Mr. P. M. Johnston; and a fourth, relating to bench ends, poppy heads and pews, is being prepared by Mr. Alfred Maskell. In the same series will be issued "The Architectural History of the English Monument," by Mr. James Williams. A volume uniform with these handbooks, now being prepared by Mr. A. Hamilton Thompson, is entitled "Military Architecture in England."

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday, June 20, Mr. Ernest George, A.R.A., president, in the chair. The proceedings were opened by a special general meeting, when the following resolution was adopted :—" That this meeting, summoned in accordance with clause 22 of the Charter, hereby confirms the resolutions passed at the special general meeting of June 9, viz. :—(1) That the Council be empowered to purchase all the shares in the Architectural Union Company not now in the possession of the Royal Institute. (2) That the Council be empowered to pay to Mr. Edward Freeman the sum of 1,250*l*. in compensation for the eventual loss of his office as secretary of the Architectural Union Company."

Mr. Henry T. Hare (hon. secretary) announced the decease of Mr. Matthew H. Holding, of Northampton, who was elected an Associate in 1881; and of Mr. Thomas Jerram Bailey, elected an Associate in 1881 and a Fellow in 1893. Mr. Hare mentioned that Mr. Bailey had only survived by five months the resignation of his appointment as architect to the Education Department of the London County Council—an appointment which he had held for twenty-five years. A vote of condolence was passed to the relatives of Mr. Bailey.

Mr. Ernest George, A.R.A., read a letter from Sir William Emerson in which he offered to the Institute a sketch-book that had belonged to Mr. William Burges, and which Sir William had purchased at an auction.

### The Royal Gold Medal.

Mr. ERNEST GEORGE, A.R.A., president, in his address said:—We have the privilege, and at the same time the important trust and responsibility, of electing a recipient for the Royal Gold Medal; it is destined for one who by his life has advanced the art of architecture either by building, by writing, or by research. The last presentation was to Dr. Arthur Evans, in recognition of his valued contribution to our knowledge by the unearthing of Knossos, throwing light on an early phase of architecture. To-day it is the accomplished architect and man of letters that is chosen by his brother architects, with Royal approval, for the distinction of the King's Gold Medal for architecture. Mr. Thomas Graham Jackson, upon finishing his University course, became the pupil of Sir Gilbert Scott, thus beginning his career in the heat of the Gothic revival; and he acquired a knowledge of the mediæval methods of building which has served him well, for I think the Gothic inspiration is felt in most of his works, though they may be clothed with forms or detail of other origin. Mr. Jackson is an artist of strong individuality, with an intimate and practical knowledge of material, and he has helped much to bring together the several arts; he was an active member of the Art Workers' Guild, of which he was some time master. Mr. Jackson has had the satisfaction of making his impress especially on one city, with which his name will always be associated. Oxford, almost unique in its survival as a mediæval city, was bound to move with the times, and we might have feared the result of changes that must come. But, by good fortune, the modern growth of that city has been generally under wise direction: the spirit of the old has been preserved, while there is freshness, originality, and beauty in most of the schools and colleges that have risen in our own time, and that harmonise happily with the works of the pious founders, and for very much of this work Mr. Jackson is responsible. He is a Royal Academician, a Fellow of the Society of Antiquaries, and an Honorary Fellow of Wadham, Oxford, while Cambridge has just honoured him with the degree of Doctor. He has a secure place among men of letters; I think his first book appeared nearly forty years ago, and it has been followed from time to time when he had wisdom to impart.

As architects we are glad to honour those among us—a small minority—who can set forth our aims and explain our cause to a world that has been rather heedless of our art; when wrongs have been contemplated Mr. Jackson's voice has always sounded clear. Architectural education is a matter in which he has always taken keen interest, and he has been a valued member of the Board of Architectural Education. His interest in this education is not limited to the architect; he would have the principles of our art understood once more by the craftsman, the builder, the employer, and the public; then we architects would be forced to do only our best. I hope most of us feel, as I believe Mr. Jackson does, that the advancement of architecture is of vastly more importance than the prosperity of the architect.

Mr. Jackson has made repeated visits to the Nearer East, especially to the Balkan States, where he has studied the Romanesque in its home, acquiring such intimate knowledge of the traditional mode of building that the Dalmatians sought his help to build the campanile of their cathedral at Zara. Of the many works of Mr. Jackson, I suppose the Examination Schools at Oxford stand out most distinctly, and we remember the interest they caused at the time of their building, inaugurating in some respects a fresh departure. To Mr. Jackson we owe modern buildings for Brazenose, Lincoln, Corpus, Trinity, Balliol, and Hertford, the new Radcliffe Library, Somerville Hall, the City High School, and the High School for Girls; also the restorations of the Bodleian Library, St. Mary's and All Saints churches. At Cambridge we owe to him the new Law Library and Law School, as well as the Sedgwick Memorial Museum amongst other buildings. From the same hands we have the restoration of many precious relics, among them Eltham Palace, Great Malvern Priory, Bath Abbey, Christchurch Priory. His also is the anxious work of maintaining Winchester Cathedral against the threatenings of underground forces. We might make a long list of churches built or restored, as well as of important additions to Eton, Westminster, Rugby, Harrow, and most of the seats of learning—a grand record of scholastic work which at the same time is scholarly work, and which will always be honourably associated with the name of Thomas Graham Jackson. He will gratify us now by coming on to the list of Royal Gold Medallists, and allowing me the honour, in your behalf, of placing upon him the blue riband of our calling.

Mr. T. G. JACKSON, R.A., after receiving the blue riband and medal, said he was certain he need not say how deeply sensible he was of the great honour just conferred on him. To an artist no appreciation can be so welcome as the appreciation of his brother artists. Architects lived indeed on the patronage of the public, who on the whole were able to form a right estimate of the merits of those whom they employed. The public were perhaps too liable to be influenced by fashion and blind obedience to be always right at the moment. They were certainly more likely to be shocked than pleased by anything in the way of originality. It was therefore rather to the judgment of those who followed the same calling as himself that the artist looked for due appreciation of his work. It is the knowledge that he has secured this in spite of his many shortcomings that gives value to any honour conferred on him. Mr. Jackson said that he was particularly touched by the fact that the Institute had bestowed its highest honour on one who was not only not a member of their Society, but on one who at times had been even an opponent of their policy—an opposition, however, that had never caused any interruption of the friendly relations between them. He had received many kindnesses from the Institute; he had in the past been nominated by their Presidents for competitions, and he had often listened on their invitation to able papers. He rejoiced to think that the matters on which they differed were in very small proportion compared with those on which they agreed. He had to confess that he still remained a hardened unbeliever in the possibility of discovering an artist by a process of examination. But however much they differed on those points he felt sure that they were all equally devoted to the art which they professed, and equally anxious for its interests. Architecture should not be called the greatest of the arts, for in true art there was no "greater" and no "less"—the only distinction being between good and bad. The one claim that he made for architecture was that it is the only necessary art, and as such it must always be of supreme importance to human society. It had been compared to frozen music; it might also be described as the poetry of construction. It resembled poetry by the varied and indescribable manner in which it affected the mind. Everyone remembered certain lines of poetry which touched them in some unaccountable way, and awakened a thrill within them which they found it very hard to explain; yet that very passage might leave another lover of poetry quite untouched. It was the same with music—some cadences may move a soul to ecstasy which leave another unaffected. And so with architecture. It appeals to different people in different ways, and to the same people differently at different times. To his mind the most sympathetic interior he knew was that of Exeter Cathedral, and he had often tried to explain to himself why it was so. It was as impossible to say why certain lines and proportions, certain arrangements of void and solid, certain refinements of detail should awaken a feeling of pleasure as to say why certain sensations will leave us unmoved. To an architect this is poetry; for architecture touches in an especial way the poetic sense. A poet is a creator, a maker, whatever his material may be, whether words or bricks. It is his power of doing this that distinguishes him from other men, and that power can never be imparted where it does not exist. Like the poet, the artist must be born and not made. There is no use in encouraging a young student who has not within him that power. He was therefore glad to see that in the scheme put forward for the education of young architects it had been suggested that the students who showed no special turn for art should be advised to take their abilities to some other pursuit. More fortunate than other men the calling of an architect is not only his means of livelihood, but also his supremest pleasure. The architect must indeed be unfortunate who cannot leave behind him some work that will do him honour.

Mr. John Slater said that as that was the last time on which their present President would occupy the chair (and perhaps as an old member of the Institute he might interpolate a feeling of regret that that was perhaps the last time in which the chair would be occupied in that room), he knew they would not be satisfied unless they passed a vote of thanks to Mr. Ernest George for the way in which he had occupied the chair during his tenure of office. It was no secret that Mr. George had had a great deal of hesitation in accepting the post, and it was only after a good deal of persuasion that he was induced to occupy it. He hoped that Mr. George would never regret having taken that step, and that he would carry away with him many pleasant recollections. They could claim that in one branch of architecture England held the palm, and that was in domestic work. There would therefore be something lacking in the history of the Institute if a man so eminent in this branch had not been on the list of Presidents. The annals of the Institute would be the poorer if it were not for those addresses by Mr. George which are replete with common sense and excellent advice, and which were enlivened by a quiet play of humour which is the President's own. These were positive merits; but there were what he might call negative merits which had been equally estimable. Mr. George had individual views, and he had known how to press them at Council meetings; yet he was essentially a man of peace, to whom polemics were distasteful. With regard to the personal relations between Mr. George and the Institute, he will carry away with him the heightened esteem of those who knew him before he occupied the chair, and he had made for himself a warm place in the minds of those who did not. While speeding the passing President, he would like to express his satisfaction that Mr. George will be succeeded by Mr. Leonard Stokes, and also to express a hope that the latter will have a happy and successful year of office.

Sir Aston Webb said that as he had had the honour of speaking the first words of welcome to Mr. George, it was appropriate that he should say the last at the time when he was leaving, and to express their great obligation for the work that he had done as President. It was understood when Mr. George took the chair that he had some hesitation as to the way in which he would occupy it. But no one else had the least hesitation in the matter. They were proud to think that so distinguished an artist had been at the head of affairs for the last two years. Sir Aston said that as he was no longer in the firing-line he could not claim to have seen Mr. George in the Council meetings, or with his coat off in the arena as had been suggested, so that he had nothing to say on that side. But he did know that as Mr. George was leaving the chair he was leaving behind him an aroma which will always be pleasant to those who follow; an aroma of kindliness and sympathy and of good humour and good feeling. Mr. George had made no enemies, and only won friends; while at the same time he had always done his duty. He begged to second the motion that the very best thanks of the Institute should be given to Mr. George for his notable services as President.

Mr. Ernest George, in replying, confessed that he had accepted the presidency feeling that it was not in his line at all. It had been a great pleasure to him to be associated with men who were giving their time for the common good of the profession. He also had to thank the very efficient staff, more particularly their secretary. He was convinced that the Institute was doing very useful work. Before he accepted office he had not realised how much quiet work there was to be done, and how many important things occurred. Mr. George said that he had tried to do his best according to his lights, and that he would like to thank everybody for their help. It was pleasant to know that he was being followed by a man like Mr. Leonard Stokes.

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The Christian Science Society, Swansea, have purchased a site on Walter Road for a church and lecture hall; the latter is to be built immediately. The cost of the buildings when complete will be 10,000*l*. Mr. Glendinning Moxham, F.R.I.B.A., Swansea, has been appointed the architect to carry out the work.

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## THE ARCHITECTURE OF LONDON HIGHWAYS.

By "Viator."

### II.—THE STRAND.

In an article contributed to the columns of *The Architect*, we ventured to criticise the art of Fleet Street in what purported to be a humorous vein; but it is possibly preferable to exchange this for a style at once thoroughly serious and seriously thorough, as being more in accord with the claims of architecture. It is necessary also to bear in mind that any criticism, however honest it may be, must insensibly be slightly tinged—we would not say tainted—by the personal tastes of the critic; but after conceding that point, it is hoped that the general tenor of what follows will be accepted as the result of carefully based and impersonal views.

In the short walk between Trafalgar Square and Chancery Lane, a most heterogeneous display of frontages meets the eye of the spectator, more varied, we surmise, than can be provided by any other main artery of the metropolitan system. In our view, this is preferable to the co-ordinated architecture favoured on the Continent, though it may be granted that such a view is one of individual nature; and yet, there is reason in this preference, if only on the plea of consulting various individual tastes, for co-ordinated architecture can appeal merely to those who are adherents of the particular style, whilst the English method endeavours to provide at least a modicum to satisfy all tastes.

In the first half of the nineteenth century the Strand was "improved" under the artistic guidance of John Nash and (at a later date) of Sir James Pennethorne. Modern commercial stress has caused those improvements to be unavailing and a modern scheme is in slow process of development; the result is displeasing, pending the completion of the scheme, the varied widths between curbs and building lines proving offensive to the eye and obstructive to the traffic. But we dread the day when further widenings shall entail the disappearance of some of the old frontages that possess a merit apart from their antiquity. Regard, for example, Nos. 229 and 230 on the south side, near the Griffin; their picturesqueness arises undoubtedly from the simple art displayed in their design, and not in any degree from age, which would merely provide antiquarian value. The Great Fire spared these and a few other still-existing premises; in days of pretentious design the sight of these two façades is restful in the extreme. In the march of progress, however, the coved overhanging superstructure of the one, and the angular bay of the other will doubtless disappear. There are many old buildings still left in the Strand, some ante-dating, others post-dating A.D. 1666, but the mere age of them causes no quickening of our artistic pulse. Coutts's old premises possess nothing but the historic interest; on the opposite side of the thoroughfare, however, next the Adelphi theatre, and over against the Tivoli theatre, there stands a building whose interest is at once antiquarian, historic and architectural—in the days when Cromwell protected England the house was occupied by that eminent Jew, Menasseh Ben Israel, whose efforts brought about the readmission of the Chosen People into the land of Liberty, to the reciprocal advantage of both. A curious old façade is this, with its oddly variegated symmetry, with the well-projected bays and cornice, the latter finely carved, the egg-and-tongue and the modillions standing out boldly.

It is but a few years ago that a critic on architecture had to proceed on the lines of lamentation for the lost glories of the past in view of the then existing state of poverty of design. We may be thankful that the nadir is receding from view (the imperfect simile may be condoned), and that words of praise can be accorded to the current architectural trend, not merely to selected buildings. Bearing this in mind, it may perhaps be the best method of treatment to discuss the buildings with some regard to their period of erection, and this method brings next under our notice three churches, whose interest architecturally is due in the main to one architect, viz., James Gibbs. The church of St. Clement Danes is, we grant, the work of Sir Christopher Wren, for the most part, and very indifferent too, the sole feature that we can commend as out of the common and as at all pleasing being the hemispherical domes over the wings flanking the tower; the latter, which provides the attraction towards this building, is the work of Gibbs (A.D. 1719), and the attraction is justified by reason of the good proportion, varied unity, skilful design, and pleasing adornment. And these criticisms are equally due to the church of St. Mary-le-Strand (A.D. 1714-17)—a gem, some of whose facets are perhaps imperfectly cut, but none the less a gem; the tower, it is true, suffers when viewed (or more correctly the spectator suffers when viewing) from the north, as the stages look so attenuated and contracted; but the architect is not to be blamed really, as the north and south aspects were not designed for observance from a distance, as may be seen by viewing the tower from the south side of the Strand, no unpleasant effect resulting. We must grant that the extravagant use of broken pediments and the elaboration of niches never intended for occupation are deplorable, here as on St. Paul's Cathedral and elsewhere, but in other respects we doff our hat to the church for all its merits, amongst which the segmental colonnaded portico raised on nine steps is notable. The ornament, too, is pleasingly varied—the Ionic order being used for the ground storey, and carried up as Corinthian, with composite inter-columnar treatment for the window-cases. The carved panels on the piers of entrance gateway are reminiscent of the ubiquitous Grinling Gibbons (obiit 1721). Space will not permit of exhaustive treatment of the merits of this church, and in passing to the consideration of St. Martin's (erstwhile situated in the Fields) the same inventive genius is apparent here as in St. Mary's; less elegant than the latter, it is true, yet there is a sterling solidity about St. Martin's that has its own merits. This church (1721-26) was evidently designed for a more open site than either of the two previously discussed, and we may justly take pride in the magnificent colonnaded portico that stands so nobly on its broad flight of steps at the west; we object to the restless cutting-up of the window architraves by means of projecting blocks and voussoirs, but the church in general is a fine instance of early eighteenth-century architecture.

The present situation of St. Mary-le-Strand is different to what it originally occupied, the cause of removal being the high and puissant Protector, the Duke of Somerset. This nobleman desired to erect for himself a palace on the banks (*i.e.*, the Strand) of the Thames, and to this end he laid violent hands upon various properties—principally ecclesiastical—amongst these being the church of St. Mary-le-Strand, which was subsequently rebuilt on its present site.* The new palace reverted to the Crown after Somerset's attainder, and after various vicissitudes the property subsequently known as Somerset House was appropriated by Act of Parliament for the purposes of Inland Revenue and the Navy. Sir William Chambers was called in, in the year 1775, to prepare a scheme for new buildings and for embanking the Thames, and for fifteen years (1776-91) matters proceeded, Chambers's original estimate of a quarter of a million sterling for a complete building being exceeded for merely a portion of it to the extent of 50 per cent. Sir Robert Smirke and Sir James Pennethorne respectively added to and completed the buildings, but we are here concerned only with Chambers's Strand block. The severe criticisms to which the new buildings were subjected in contemporary journals were as inappropriate as the milder animadversions of recent years. The work exhibits the qualities of restraint, good proportion, dignity, and a quiet suitability that should secure for it our hearty approval. It is true that the ornamentation might have been increased without raising a charge of overloading, but Sir William Chambers was satisfied to gain his desired effect otherwise. The sole adverse criticism we would offer is in respect to the illogical and tame equality of the three arched openings; the carriageway entrance should assuredly have been treated on the same generous principles as might be seen in the old City Gates, though it may be that the architect did not wish to lessen the apparent importance of the wings, devoted to the Royal Academy of Arts (on the right), and to the Royal and Antiquarian Societies (on the left).

An architect whose work commands respect—the late Edward M. Barry—has helped to adorn the Strand with two, nay with three, buildings, one being merely a replica of Queen Eleanor's Cross erected at the village of Charing, but forming (whether in the original or in the copy) a very interesting spectacle for passers-by. Charing Cross Hotel is expressive and dignified, and is also one of those buildings, too few in number, of such a quietly satisfying aspect as to receive approving notice without fixing the attention. The same criticism applies to other work by Edward Barry—a notable member of a notable family. We may instance Cannon Street Hotel (which is outside the range of this article's criticism) and the premises in the Strand for the Art Union of London. The latter has a pleasing façade, but is subject to certain animadversions—(1) that there is at least a tendency towards excess of ornament; (2) that the rustication should, by preference, not be carried up the whole height of the façade; (3) that the spandril figures give the effect of slipping away from their uncomfortable perch. But the façade is quite architectural in the best sense of the term, and a specially satisfactory feature is the carved tympanum over the entrance. Lettering at a great height is always to be deprecated as a wasted effort, and the motto "L'Union fait la force" on the architraves of the second-storey windows is barely readable, only submitting itself to the diligent searcher.

The Temple Bar Memorial—the dragon rampant—calls for passing notice. The griffin (as the figure is generally called) is disproportionately large for its pedestal, and the latter is not sufficiently subdued in treatment, the best portion being the base with its simple contours and quiet bronze panels. Some slight idea as to whether it is or is not an architectural improvement upon the old barrier may be gained by the gilded likeness of Temple Bar projected from the façade of the restaurant of that name. A journey to Theobald's Park might result in a comparison with the actual structure re-erected there by Sir Henry Le Meux. But reference having been made to Temple Bar Restaurant, we may express our strong approval of this façade, the inset bowed treatment over shop level, varied again near the roof by a concave sweep, being distinctly attractive. The old-style shop front is good; and if objection is taken to the use of Labrador granite as providing too great a contrast in tone with the white stone superstructure, there is no desire to insist too strongly upon the criticism.

The next buildings that demand our notice are the Law Courts, the great Mid-Victorian failure in regard to appearance, acoustics and convenience. That it is a monument to Mr. G. E. Street's personal activities we all know, as also that it is evidently the work of a man whose knowledge of Gothic was only equalled by his love for it. But we cannot profess to admire these buildings merely because a large number of the British public admires them. The screen wall is distinctly good, the clock and stair towers are very passable, and the ironwork is satisfactory; but it is curious in the extreme that of the various phases of Gothic, Street failed to use the only one that was suitable, and that is the Perpendicular style We regret too the parsimony that we must suppose dictated the use of red brickwork in combination with stone for the eastern wing, and for the eastern wing alone. We may contrast these buildings in regard to the dubiety with which a stranger might view them as to their purport with the fine expressive Central Criminal Court, the outcome of the late Mr. Edward Mountford's genius. It is interesting to note how often buildings contrast unfavourably with those designed by the late Alfred Waterhouse, and this is one more instance, the Gothic office-block of New Court being a magnificent scheme and tending all the more to cast into the shade the Law Courts on the opposite side of Carey Street. Much of the detail of Street's work is naturally of a high order, but we are justified in objecting to buttress-supported square (or other) bays. We will hope that the Law Courts extension in Strand Park will make some amends for the defects of the original building.

Nine big hotels, if not more, within this one short thoroughfare, are but a sign of the times, a sign too that meets with the approval of those architects who make a specialty of this class of work; and within the last few years the Strand has been very much transformed by the erection of these palaces for a floating population. We wish to draw attention to four hotels—one truly not in the Strand, but at present forming one of the features of the thoroughfare, as there is but waste and desolate land between it and the Waldorf Hotel; the others referred to are the Savoy, the Gaiety, and the Strand Palace.

The Savoy and Strand Hotels are instances of the successful employment of Carrara ware, whilst the Gaiety and Waldorf are stone-fronted to satisfy the requirements of the London County Council. Whereas the green bands on the chimney stacks of the Savoy are an eyesore, the green Doulton ware used for the main entrance of the Strand Palace Hotel is very effective. As Gandy-Deering's fine Exeter Hall façade had to disappear, we may be glad to have such an adequate substitute as is here provided. Carrara ware (Doulton ware) has an effect of interfering with architectural design; this is to an extent to be noted in the Savoy Hotel, but the narrow frontage of the Strand Palace has been well managed, both in regard to decorative ornament and colour treatment; the dull green massed around the entrance is very different in effect to the green bands before-mentioned.

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* The other properties seized were part of the church of St. John of Jerusalem; the tower, cloister, charnel-house, and chapel on the west side of St. Paul's Cathedral; the episcopal palaces of Chester, Llandaff, and Worcester, and the Strand Inn (Chancery). Westminster Abbey is said to have escaped only by means of the Chapter making contributions to appease the Duke's rapacity. An anecdote is related of the Bishop of Llandaff, appointed shortly after the depredation; he remarked that as the *land* was denied him he was only Bishop of "aff" (half). The palace was commenced in 1549, Somerset being executed a few months later under a warrant of Edward VI., and his property was seized by attainder.

But the Savoy Hotel is good design, with its shallow continuous bays, its circular domed angle blocks and its restrained use of decorative ornament, and the low-crowned wide-spanning arched entrance to courtyard is very effective. The historical interest of the site of this hotel is set forth in a series of panels, to which reference should be made. Before leaving the subject of Carrara ware, reference may be made to Romano's Restaurant, situate opposite the Hôtel Cecil; the buff faïence there used as a facing is as practically useful as Doulton ware, but is thoroughly inartistic and uninteresting. The Hôtel Cecil itself does not merit notice, merely supplying unrealised possibilities.

For the sake of disposing of the hotels, the chronological sequence has been temporarily set aside, and in reverting to the Gaiety Hotel we are setting back the hands of the clock very considerably—such a commonplace structure! until the eye travelling upwards reaches the sculptured frieze, which must not be too closely examined for significance, but must be accepted as sounding together with the well-projected but insufficiently deep cornice a pleasant note of relief. And this brings us to the last hotel of which we desire to take notice in this article. Messrs. A. Marshall Mackenzie & Son may be heartily congratulated upon the satisfactory design that they have evolved for the Waldorf Hotel; if a colossal order may be held justifiable anywhere, it may be certainly welcomed here. The detached Ionic columns running through three storeys are varied in the pavilionated wings by Ionic pilasters. The elevation is well-proportioned, and it is to be regretted that such a fine building should be lowered by possessing such an extremely silly series of carved frieze-panels; no plea of precedence or custom can render them pleasing. The completion of the Waldorf block by a theatre wing at either end, whilst satisfying the artistic sense in the method of treatment, is to be deprecated here, as elsewhere in Shaftesbury Avenue, where two theatre exteriors are replicas on either side a central block for the sake of artistic symmetry. No two theatres, no two buildings ought to present an exact presentment of each other.

And this brings us to the consideration of the Gaiety Theatre, which has been not inaptly dubbed the "New Bailey." We are aware that in this building and the adjoining hotel there were limitations in the way of the architects' freedom of treatment; but assuredly the latter might have been less unsatisfactory. The theatre is a mass of massiveness—Blunderbore unredeemed by any graces, except such as may be provided by the loggia treatment; for certainly the green bands of the ground storey provide no redemption. The dome is very unpleasing, and the crowning figure of Fame is unsteadily poised in appearance upon her golden ball, though as she possesses wings, the importance of a gravity-support is minimised.

This building, intended as a home of light opera, and so far from expressing its purpose, may be contrasted to its own disadvantage with the new premises for Coutts's Bank, occupying the site of the old Lowther Arcade. The banking establishment has an historical reputation to preserve and an ever-present business importance to make manifest, and it would be more than pardonable to express all this by a severe exterior. But Mr. J. Macvicar Anderson has produced a building that, discarding severity, has been satisfied with restraint, with a result wholly pleasing. Objection may be taken to the projecting voussoirs of the semicircular arches, and it would have been an improvement if the columns to the window-cases had been left plain instead of being rusticated. The Doric recessed entrance is good, and the recess carried up through first and second storeys gives a pleasing variety to the façade. There is a fine cornice and attic over all, and the discerning public may be congratulated on the exchange of an indifferent arcade for such a fine bank.

What shall we say of the *Morning Post* buildings? If we represent it as a huge architectural sham, it is a crime that is too common nowadays, and by repetition it renders each criminal less criminal than would otherwise be the case, and we may add that similar limitations may have affected the design as in the case of the Gaiety Theatre and Hotel. If the theatre possesses a bloated dome, no such charge can be levelled against the dome over these buildings, for it is meagre in the extreme; indeed, the whole building acts as a foil to the theatre, though we fear the latter is not in a condition to benefit as much as we would desire.

But a contrast may be more advantageously instituted between the *Morning Post* offices and Mr. H. T. Hare's design for the United Kingdom Temperance and General Provident Institution—a contrast wholly to the disadvantage of the former, for Mr. Hare's building can stand upon its own positive merits. How very skilfully he has dealt with the concave sweep, where the *Morning Post* treatment is quite ineffective. The Institution offices form one of the finest of modern buildings; there is artistic regard for light and shade, proportion, mass and ornament. It is an interesting feature and one worthy of note that with very little actual ornament there is an effect of a highly ornate building; but perhaps this is due to the groups of sculpture (the vivid sculpture, as it may well be termed) and the mezzo-relievo figures over the first floor. The sculptured figures seem to lack merely the colour of life to be enabled to leave their posts, for the breath of life they seem to possess already; indeed the figures on the angle of the building are uncomfortably vivid in effect for the spectator's peace of mind. Broken-based pediments are deplorable, but the broken-flanked pediment at the angle looks well in this instance. The angle treatment might have been advantageously carried somewhat higher, but these are at least trifling in view of the effect of the whole building.

The vivid and well-modelled sculpture contrasts favourably with the groups upon the Gladstone Memorial opposite the Institution offices. The bronze figure of the statesman is very dignified, and the pedestal itself is good, but the groups are very spiky and restless in effect. We have but two more buildings to which we desire to refer. The offices of the British Medical Association situated near Charing Cross raised a small tempest of discussion at the time of their completion, for it seems that Mrs. Grundy was wofully perturbed at what she saw when she applied powerful field-glasses in order to view the sculptured figures along an upper storey of the block. Let us at once say we consider the outcry unnecessary, for the morals of ne'er an individual will be vitiated by the ghastly sculpture offered to inspection, and the whole building is vapid and uninteresting to a degree, and quite unworthy the name of architecture.

It is with some pleasure we approach consideration of the last building that we propose to discuss, as we fear that this article may be considered tediously drawn out, though we might well have extended it still further by considering other buildings. The offices of the Government of Victoria (Australia) have an interest that may be mentioned in passing, namely, that they are the first erection on the waste land facing the Strand, the land made desolate by a costly scheme of improvement, for which the recoupment is being so long deferred. Mr. Alfred Burr, the architect, has produced a very architectural building, wherein a great deal of the expected effect lies dormant, pending the completion of the block by an eastward extension; in fact, these offices form but the narrow western wing of the whole scheme. The co-operation of Mr. Norman Shaw was invited by the London County Council, and his artistic powers are in evidence here as they are elsewhere in London, but the main credit is due to Mr. Burr. As the building is at present, the heavy cornice under the gable does not look well, but in the finished scheme it will serve to carry through the lines of the heavy entablature over a colonnade. Still, it would have been an improvement had the cornice been omitted here, for it is a misplaced feature as it stands; a light string-course would have been much better. Again, the arched window-treatment of the ground storey is of insufficient importance; in other words, it is not properly proportioned to the superstructure. But the whole conception is fine; and day by day, as we pass along the Strand on the way to our office, we eagerly scan the vacant site to see whether a board has been erected announcing the approaching erection of the centre and east wing of a block of buildings that will still further help to roll away from our country the reproach that we are but a nation of shopkeepers, with our eyes nailed to our ledgers and a soul dead to the claims of art.

## R.I.B.A. TOWN PLANNING CONFERENCE, OCTOBER 10 TO 15, 1910.

THE exhibition committee would be glad if architects and others possessing drawing or models illustrating town-planning design, which they would be willing to lend for exhibition, would send particulars thereof to the undersigned at as early a date as possible.

The space at the disposal of the committee being limited they are unable to accept illustrations of buildings other than such as have a definite connection with the subject of town planning.

John W. Simpson,
Secretary-General of the Conference,
9 Conduit Street, Regent Street, W.

## THE ILLUMINATION OF INTERIORS.

### LECTURE II.—LIGHTING BY GAS AND ELECTRICITY.

THE second lecture of a series on the "Illumination of Interiors," was given at the East London College (University of London) under the above title, by Professor J. T. Morris, M.I.E.E.

The lecturer stated that before coming to the subject proper, he wished to correct a mistake which had crept into the last lecture on the subject of "Daylight." The Trotter photometer used for the tests was graduated on the assumption that the light from all parts of the sky was the same. This is by no means the case, and from direct experiments carried out by the lecturer since the first lecture, he had arrived at the conclusion that the figures given last week for outdoor illumination should be divided by about five. This for instance, would make the maximum intensity of light on a bright summer's day of the order of 3,000 to 4,000 candle feet, not 17,000 to 18,000, given previously. Similarly the average ratio of inside illumination to external illumination should be about 0.01 instead of 0.002. Coming to the lecture proper the lecturer first summarised the methods of using gas and electricity in various types of lamps. Referring to the first method of illumination the lecturer pointed out the vital importance of calorific value. In testing a Keith high-pressure burner under identical conditions in East London and North London, the candle power in the latter case was over fifty per cent. more than in the former. On the question of intrinsic brilliancy (i.e., candle power per square cm. of illuminant), some interesting figures were given for different sources of light. Comparative figures were:—Arc lamps 16,000 candle power per square cm., Tungsten lamp 150, high-pressure gas 25, carbon filament lamps 16, &c. Anything more than, say, five is very trying to the eyes if viewed direct. Hence Tungsten lamps and high-pressure gas lamps especially should never be viewed directly. The question of fluctuation of source was next discussed, and a large number of figures and curves exhibited to show the variation of light on the electric railways and tramcars of London. This fluctuation, which is far greater than generally imagined, is much greater on some railways than others, and much worse where carbon lamps are used rather than metallic filament lamps.

Speaking of the general distribution of the light in a room a curve was exhibited from special tests, to show that in one case where an arc lamp was employed the effect of lowering the lamp was actually to decrease the light where it was most required, although the illumination immediately below the lamp was, of course, considerably increased. The final lecture of the series on "Petrol Air-Gas," by Professor C. A. Smith, B.Sc., will include a working exhibition of several plants by leading makers.

## MANCHESTER SOCIETY OF ARCHITECTS.

ON Saturday, June 11, nearly thirty members of the Manchester Society of Architects visited Peover Hall, near Knutsford, Cheshire, under the leadership of Mr. Isaac Taylor. By the courtesy of Sir H. S. Mainwaring, Bart., arrangements had been made for the members to be conducted through the Hall and adjoining buildings. The main portion of the Hall, a red brick building of Georgian date, is hardly an inspired piece of work, although it has a very simple and effectively treated staircase. The large Elizabethan wing, however, containing a huge kitchen and five upper rooms, is of the most delightful charm; the lovely colour of the old brickwork and stone, the fine stone mullioned and transomed windows, the grouping of the chimneys and sharply pointed gables, all contribute to an effect of the utmost beauty. It was this portion of the group of buildings that figured most prominently in members' sketch-books. The stables are extremely interesting, especially the earlier block containing Jacobean stalls sumptuously adorned with oak columns and the characteristic strapwork of the period. The adjacent church contains in the side chapels some fine tombs of the Mainwarings. Mr. Isaac Taylor was the leader.

On the Tuesday evening following, a large number of members visited Middleton, and inspected two elementary schools, by Messrs. Edgar Wood & Sellers, under the guidance of Mr. Sellers. While it is quite the usual thing nowadays to find elementary schools planned with every requirement and convenience, duly supplied with good lighting and proper aspect, it is rarely that one finds these qualities combined with so serious an attempt at fine architectural expression as in the case of the Elm Street and Durnford Street schools. At Elm Street the treatment of the entrance court, with groined cloisters at the sides and a semicircular sweep of low buildings in front of the central hall, and the striking treatment of the interior of the central hall and its fenestration are the outstanding features of a remarkable design, while at Durnford Street, where the plan is on more usual lines, the building towers up in great masses the dignity of which is immensely enhanced by the severity and restraint of the design.

## THE RESTORATION AND RECENT DISCOVERIES AT THE GUILDHALL, LONDON.

*(Concluded from last week.)*

CONSIDERABLE interest was taken by the Press and by the public in the discovery last autumn of the one and only original and complete window in the great hall. It has been stated that the discovery was "accidental," as if a plumber wanted to fix a waste pipe, and cut into the walling and found some fifteenth century work, but there was nothing in the slightest degree accidental about it.

The hall had just been cleaned, and you can now distinguish between old stone, new stone and cement with the greatest ease. Here is a slide showing the window in question and also the adjoining bay which has a blind arcade into which a bronze memorial has been fitted. The bay, at the back of which existed the window, presented an almost identical appearance; the centre portion was divided into three parts, but there was this difference, the mullions of the bay in front of the old window were of cement and those of the bay containing the statuary were of stone. At first I naturally thought that the stone work in one bay had been damaged by the Great Fire and made good in cement, the adjoining bay being taken as a model, but a close examination showed that the main moulding that runs around the opening has a perfectly smooth face at the points of junction with the tracery. Now, had the entire original tracery been stone, the moulding would, in all probability, have been rough and indented, showing fractures at those points. This was the first indication that there might have been no tracery when the building was erected. I followed up this idea by having a small hole 4 inches by 4 inches made at the side of the moulding; had the stone been embedded in the wall, and formed portion of a continuing wall, it would probably have been somewhat rough, and certainly would have had the return face at right angles to the main face. Instead of that it was smooth and splayed. This showed at once there was a recess of some sort in the original structure; the small opening was driven through until the jamb of the window appeared, then the whole of the brick and cement filling were removed and the window appeared as you see it on the screen. It seems that the window had twice been blocked out, for just inside it and at the back of the recess there had been fixed some wood framing; this had been lathed and plastered, and then at a subsequent date, in front of this lath and plaster work, the brick filling had been inserted so as entirely to block up the recess, and make the face level with the wall adjoining.

The recess opposite was treated in exactly the same way, but here the window was found much mutilated. I hope, however, it will be restored as soon as accommodation can be found for the occupants of the office at the back of it.

After the discovery I naturally referred to old plans and views. I find one window is shown upon a plan prepared about 1750, but there is no trace of a record of the other window.

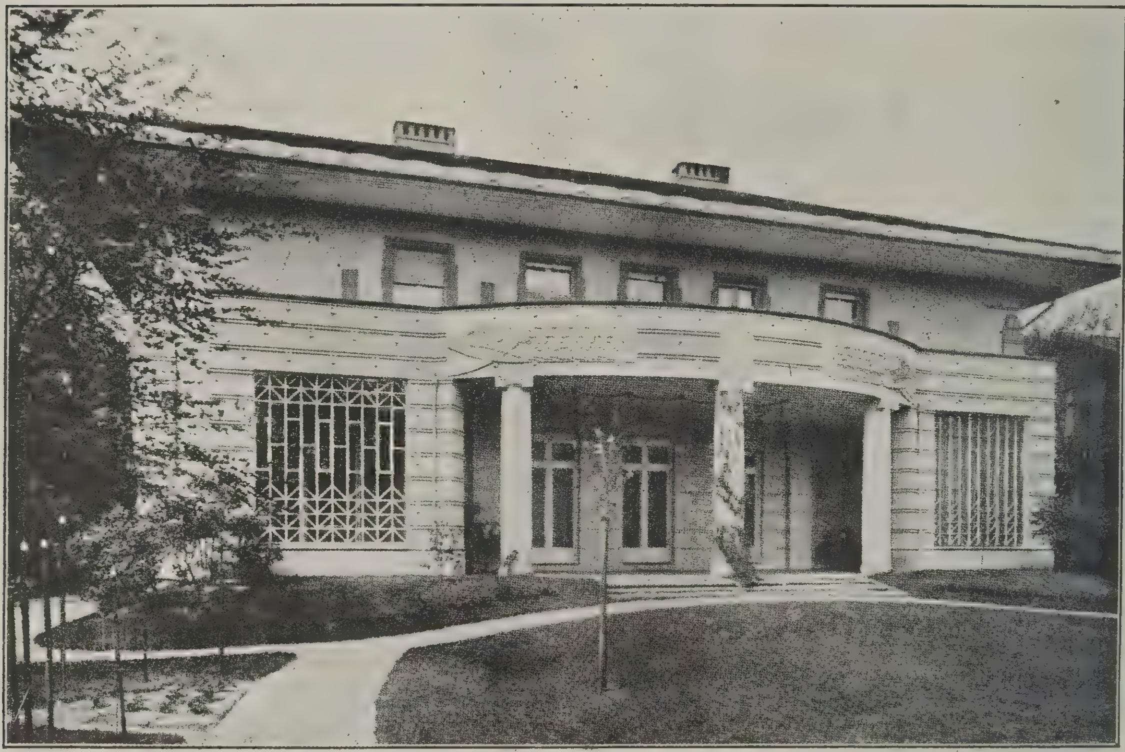
With regard to the south window this has received further attention, and the brick wall on the outer side has been removed.

Without doubt this is an extremely interesting window. In the first place we find the two window seats, one on each side of the opening; these are frequently seen in early domestic work, and fine examples exist at Stokesay and Alnwick, but no examples exist as far as I know in ecclesiastical work.

The next thing to notice is the right-angled rebate formed for the shutters. A similar rebate exists in the windows in the crypt. At the lower portion of the window the old hooks can be seen on which the shutters were hung. There are no traces of any hooks to the upper part, so probably these lower shutters were about 2 feet 2 inches high; but apparently the upper part of each window had a movable shutter similar to those frequently fitted to shop windows; each of these rested on the hinged shutter below, and holes in the stonework above were probably used for the insertion of a wood shutter-bar. When we see stout stay bars and stanchions for protection the use of the shutter seems unnecessary, but we must also consider at the same time the glazing. In the western part of

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Berliner Architekturwelt.*

A COUNTRY HOUSE, GROSS LICHTERFELDE OST.—Herr Sepp Kaiser, Architect.

the crypt there are no signs of any glazing, and the shutters were necessary as protection in bad weather. But when we see, as in the great hall, a groove in the stone for glazing, stanchions and also shutter rebates, then it would seem that either originally there was no glazing and the shutters were necessary, and the glazing subsequently added, or else the shutters were used as we use blinds to-day.

Now with regard to the glazing, in 1422 the executors of the great Dick Whittington glazed some of the windows of the great hall, and also of the Mayor's court. In 1643 certain aldermen were instructed to examine the windows and have them destroyed if they considered "the pictures and figures in the glass windows within the Guildhall and Chappell idolatrous." This they considered they were, and they were destroyed. It is obvious that the windows had to be reglazed, and apparently some of the glass now in the window is the glass that was then fixed.

Only a portion of each light opened, this had an iron casement and frame; the remainder of the windows had the lead work fixed into a groove in the stone work. The iron latches, although very rusty are charming in design, and I believe they are the original fastenings that were fixed at the time the hall was first glazed. Each is fitted with a spring very similar to the thumb latch of a cottage door of to-day, and not much like a modern casement fastening.

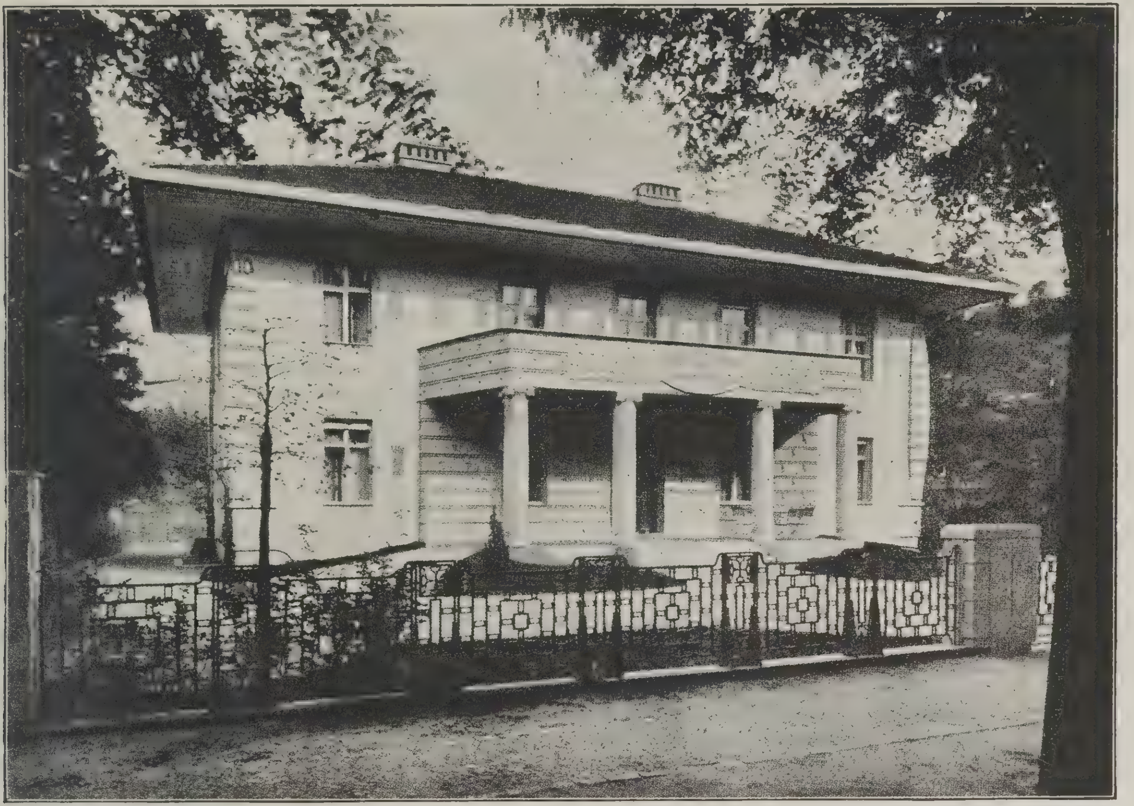
I stated at the commencement of my paper that the Guildhall was commenced in 1411, consequently next year is an important one in its history, for it is the quincentenary or 500th anniversary of its foundation. What would be a more fitting way of celebrating the event than by restoring the western portion of the crypt? We know that the scheme now in hand will add the eastern end to the museum and open it up free to the public, and this good work might be continued next year. It would have to be taken in hand with other alterations, as the western part is now occupied as cellars, furnace rooms, &c., but the scheme is quite practical.

I know you will be glad to hear that the members of the Corporation take the greatest interest in the building, and in the opening up of old portions. The committee dealing with the structure is known as the City Lands Committee, and is the premier committee of the Corporation. Last year Mr. W. H. Pitman was the chairman, and he visited the building constantly, coming up to London to meet me during August and September, and helping in every way the good work so dear to him. This year the work is being energetically carried on by the chairman, Mr. Deputy Painter, who took his committee over the crypt only a few weeks ago. Do not think past neglect implies future negligence. Every member of the Council is anxious to do the right thing, and no fitter motto could be quoted in conclusion with reference to the restoration than that of the Corporation, "Domine dirige nos."

The Chairman said he was sure they had all been exceedingly interested in the paper which Mr. Perks had read to them, and in the fine lantern slides which illustrated it. He felt Mr. Perks had combined in his paper very skilfully the study of old documents bearing on the subject of the old Guildhall, and, what was more important, the study of the actual structure, which, with his expert knowledge, he had managed to make very complete. Mr. Perks had certainly shown them that while Mr. J. E. Price was honest and very learned, he had made in his book various important mistakes. The speaker said he would like to say on the part of his old acquaintance that he felt a singular regard for his memory, and therefore he wished to state that Mr. Price was an enthusiastic antiquary who did much good work, but he was more particularly a student and expert on the subject of Roman remains. He wrote some interesting papers on Roman remains in London, but as regards the architecture of the Guildhall he was rather out of his element, because he was not a man possessing great knowledge of Gothic architecture. Still his book would stand as one of no small value. Mr. Perks, in his paper, had recorded some most important discoveries. One was the way in which he had worked out the dates of the two crypts—the eastern and western—and made them correspond with old documents. Fabyan spoke of the ancient Guildhall as a little cottage. Stow stated that it faced Aldermanbury; but Mr. Perks had worked it out that the building then would have been 229 feet long instead of 150 feet long as at present. The lecturer had also found out how the vaulting of the western crypt was built, and he had proved to most of them that the eastern and western crypts were of the same date, *i.e.* commenced in 1411. It was rather remarkable that the two should be so different in construction, but it was clear to the Chairman, he said, that the eastern crypt was an important sub-hall where particular meetings were held, and the western one was more in the nature of a cellar and not used as a place of meeting. One of the reasons which proved how much care was lavished and how important the eastern crypt was considered by the builders was the very fine approach given to it, and which Mr. Perks had

## MODERN EUROPEAN ARCHITECTURE.

### GERMANY.



[From *Berliner Architekturwelt.*

A COUNTRY HOUSE, GROSS LICHTERFELDE OST.—Herr SEPP KAISER, Architect.

opened up. The approach from the south had a fine door with niches on each side and stone steps down to the floor of the crypt. While Mr. Perks had studied with very great care those two little turret staircases and had discovered several interesting things about them, yet everything had not been explained, but very likely in the course of time he would find out more about them. They were grateful to the author for those interesting discoveries. He had also found the passage to the north which led from the crypt to the hall. Mr. Perks had not said much about the admirable work he was doing in the east crypt, which would restore the building very much to the state it was in soon after it was built. One of the results of his labours, with the co-operation of the City Fathers, was that there was a very good prospect in the near future of the crypt being made easily accessible to the public. With regard to the hall, Mr. Perks had done excellent work in removing the thickness of cement which had so modernised it, and had made him feel, as the author himself had felt, that it was not genuine. That had been the belief of a great many people, and they had not inspected the building with interest because it appeared to be almost a modern one. The author, by his work, was giving the hall a far more agreeable appearance and was adding interesting facts of the history of the building. They could see the action of the Great Fire, and also where the new masonry begins. A few years ago, he believed it was in 1903, they would remember the crypt of the religious house of the Blackfriars was unearthed, and he saw distinctly the action of the fire on the masonry; he chipped off a piece of the stone and found that the fire had penetrated it and discoloured it to the depth of an eighth of an inch. In the other discoveries in the hall the interest was enhanced by the discovery of the window on the south, and of a corresponding window on the north side, which, however, was not in such a good state of preservation. Mr. Perks had quite proved that the glazing and the fittings of the south window dated from 1643, immediately on the destruction of the windows which dated probably almost from the time of Whittington. As regards the stone, Mr. Perks had found examples of the stone flooring, and he showed a piece of Purbeck—green Purbeck, the speaker supposed it was—which had formed a part of the flooring of the hall, which they knew was done immediately after the time of Whittington. It was interesting to recall the fact that when Crosby Hall was pulled down a flooring of green Purbeck was found immediately below the wooden planking which had been put on in modern times. The date of the Guildhall specimen was 1411, and onwards; he imagined it was finished in 1413, while in the case of Crosby Hall it was considerably later, as the building was not begun until 1466. Mr. Perks had referred to six interesting allegorical statues on the porch which disappeared in 1782. From what he read about them they seemed to have been of great interest, and there was an admirable drawing of them in the Gardiner collection. Originally above these six statues was a statue of our Saviour, and William Elderton, a sixteenth century versifier, wrote rhymes about them:—

> "Where Jesu Christ aloft doth stand,
> Law and learning on either hand."

He trusted that Mr. Perks would be able to trace those statues, but he was very much afraid he would fail to do so, because various inquiries had been made with regard to them from time to time, and it seemed as if they had entirely disappeared. In conclusion the Chairman said he was sure all present were extremely pleased to find that Mr. Perks had done such admirable work, and they felt certain that, with the kind co-operation and help of the City authorities, he would be able to bring it to a successful termination.

Mr. Deputy PAINTER (Chairman of the City Lands Committee) said the members of his committee were anxious to do all they could to assist the surveyor in the work he was carrying out so well. He hoped the public would take the opportunity towards the end of June of visiting the crypt, the great hall, and the staircases, because he was sure if they did so they would be deeply interested and would go away with a remembrance which would last for many years. He was pleased to hear Mr. Perks refer to the great disfigurement of the fine stone canopy by the wooden one, which would look well in many places, but not in the Guildhall. They had had a part of it taken down, and most of those who were present on the occasion were very pleased with the effect produced. On account of the expense they did not do more, but he hoped the work would soon be recommenced, because he was sure they would all be delighted to see the fine stone canopy with some good arras hanging beneath it. It was also one of his ambitions to see the west end of the crypt restored, the groining taking the place of the present brick arches.

Mr. W. H. Pitman sympathised with what had been said with regard to the disfigurement of the stone canopy at the eastern end of the hall. It should be hung with arras in the old way, but London smoke was rather a difficult thing to deal with, and he was afraid beautiful tapestry in such a position would not last or preserve its colour. He was sure, however, that the City Lands Committee would take the matter into consideration, because it was their great desire to make the hall as beautiful and perfect as they possibly could on the old lines. Since the author came to the Corporation as surveyor a few years ago he had proved himself to be a man in whom they could repose the utmost confidence, and he had no doubt Mr. Perks would see the matter successfully through.

On the motion of the Chairman a vote of thanks was passed to Mr. Perks, and the meeting terminated.

## OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* (New York) continues the series of articles on "The Origin and Development of Furniture," by M. Stapley, who now treats of Greek and Roman work. The illustrations this week are of two country houses in Pennsylvania, by Mr. Wilson Eyre, which are examples of picturesque simplicity.

*La Construction Moderne* (Paris) illustrates a country house, "Le Clos de l'Archer," at Meulan, by M. Edmond Uhry, and a new church at Bures, of which M. Wilfrid Bertin is the architect, neither of which are extraordinarily beautiful.

*Moderne Bauformen* (Stuttgart) gives us this month examples of modern architecture in and around Hamburg, of course all "new art," and principally the work of Herr Emil Schaudt, of whose designs the most fully illustrated is the building of the North German Insurance Company.

*Zodtchy* (St. Petersburg) contains some excellent views of the Polowzow mansion at St. Petersburg, as well as other good examples of modern Russian architecture.

*Engineering Record* (New York) gives an account of a peculiarly American piece of building operation, the removal bodily of a brick wall 23 inches from its original position. The wall was 150 feet long, 16 feet high, and 21 inches thick, and the removal was carried out at a cost of less than half that of pulling down and rebuilding. The construction is described of the large reinforced concrete grand stand at the Minnesota State Fair race track, St. Paul, which will have a seating capacity of about 30,000.

## Correspondence

*[The Editor will not be responsible for the opinions expressed by Correspondents.]*

### Students' Drawings at the Architectural Association.

Sir,—I have read with much interest the article published in your issue of June 17, on the students' drawings at the Architectural Association, and desire to point out some errors. It is to be regretted that your reviewer did not acquaint himself with the conditions governing the prizes before making statements which are calculated to give a wrong impression. In the first place, the conditions governing the Travelling Studentship prevent students who have passed through the day and evening school course from competing unless they happen also to have attended the Advanced Class of Design, a very unlikely contingency. As a matter of fact in the Travelling Studentship, Silver Medal, and Henry Saxon Snell Scholarship, there are in all only three competitors who passed through the day and evening schools.

In the Measured Drawings prize, on the contrary, upon which your reviewer commented very favourably, the winner of the Fletcher Bursary, Mr. B. F. Matthews, and the other competitor, Mr. Flint Clarkson ("Jointings"), both completed the four year course last year, and I am doing them no injustice when I say that neither of them was a scratch man as far as draughtsmanship was concerned, when in the school.

With regard to the Architectural Union Company's prize, the winner, Mr. P. D. Hepworth, whose very fine set of drawings you commend, is now in the fourth year, while of the three others mentioned by your reviewer, two completed the four year course last year.

It is a fact, therefore, that the work which your reviewer praised was the work of past or present members of the school, while that which he compared unfavourably with former years was the work of men who have not been through the school. Instead of the school course encouraging students to compete too early, it is evident from the foregoing facts that our students have in the first place contented themselves with the continued study of ancient buildings.

It is, I think, quite clear from the above that the criticisms made in the review in question are not based upon ascertained facts, and the bogey set up in the opening sentence is unconsciously killed by the writer's subsequent observations.—Yours faithfully,

Edwin Gunn, Hon. Secretary.

18 Tufton Street, Westminster, S.W.: June 21, 1910.

### Ashbins versus Ashpits.

Sir,—If "Cleanliness" will preserve his theoretical predilection for the bin, he will be well advised. One must not settle the merits or demerits of any system by consideration of chance benefits or defects, but by means of the general results. This being so, there is no doubt that the sanitary portable dustbin inaugurated an era hygienically in advance of that controlled by the ashpit.

It is, I believe, generally understood that garden refuse and spring-cleaning rubbish are not of necessity removable by the local authority, but my own experience is that a courteous request to the surveyor to send specially for removing discarded treasures, such as spring-cleaning connotes, will secure favourable attention. The practice as to removal of refuse is dependent upon the particular local authority. Here the clearance is weekly, elsewhere bi-weekly, in the City of London and other busy centres daily. In some districts the tenants are instructed to place their bins outside ready for clearance; elsewhere the carters themselves fetch and return the bins. Surely local authorities are not to be blamed if householders allow refuse to accumulate in their yards. There is no practicable Act of Parliament conceivable that can render people hygienically perfect.—Faithfully yours,

June 20, 1910. Mens Sana.

Sir,—In answer to "Cleanliness" I would reply as follows:—

1. The ashbin, most certainly.
2. Generally speaking no objection is raised, and two bronze coins of the realm, value 1*d.*, will go a long way.
3. Yes; if there is trouble apply to the surveyor.
4. Yes, certainly; in reason.
5. On this point I am not quite clear, but I believe that a law exists, and the only way the local authority can object is by showing that the rubbish is in the way of "trade refuse," when a charge can be made. See the case of the Westminster Corporation and one of the hotels.
6. I believe at least once a week.
7. I quite agree on that point with "Cleanliness."
8. Try the medical officer of health. I know of no law by which you may not burn your rubbish.
9. "Cleanliness" is quite right; I believe some authorities do. A little quiet talk with the local surveyor would possibly get over the difficulty; and buy another ashbin, "Cleanliness."—Yours, &c., E. S.

London: June 20, 1910.

Sir,—Every week I read with much interest your valuable paper from beginning to end, and was much amused at an item in the issue of June 3, relating to the insane conditions local authorities often impose upon would-be candidates for posts they advertise as being vacant under them. A letter in your issue of to-day, asking for information relative to "house refuse," brings the ludicrous offer of the Ruthin local authority (viz., 80*l.* a year for an officer with requirements such as they enumerate, who should be worth at least 250*l.* per annum) back to my mind. I wonder if they elected the candidate who was willing, amongst other duties, to help collect the house refuse. Surely they would not have allowed such a chance to slip. I am afraid I cannot answer the question of "Cleanliness" myself, but here is a glorious chance of learning what "house refuse" is. I strongly advise him to write to "The Surveyor and Sanitary Inspector of Ruthin" (for I feel sure the authorities must have elected ere this so desirable an officer), and he will, I should think, be able by now to tell "Cleanliness" what "house refuse" consists of in Ruthin, and he can then form an opinion. No doubt he will get plenty of answers, but perhaps, Sir, you will be kind enough to allow him to receive mine through your valuable columns.—I am, your obedient servant,

London: June 17. A Weekly Reader.

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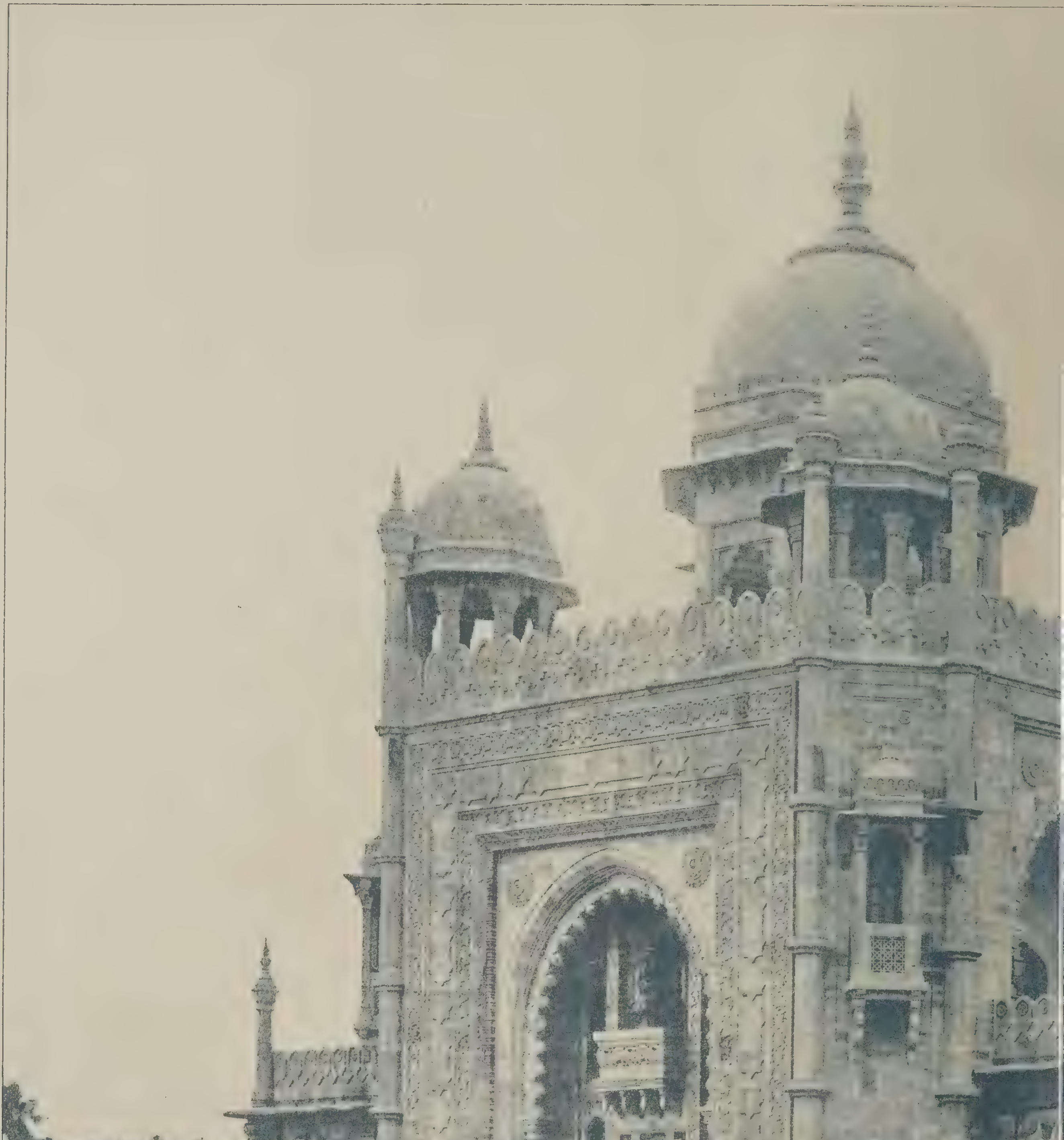
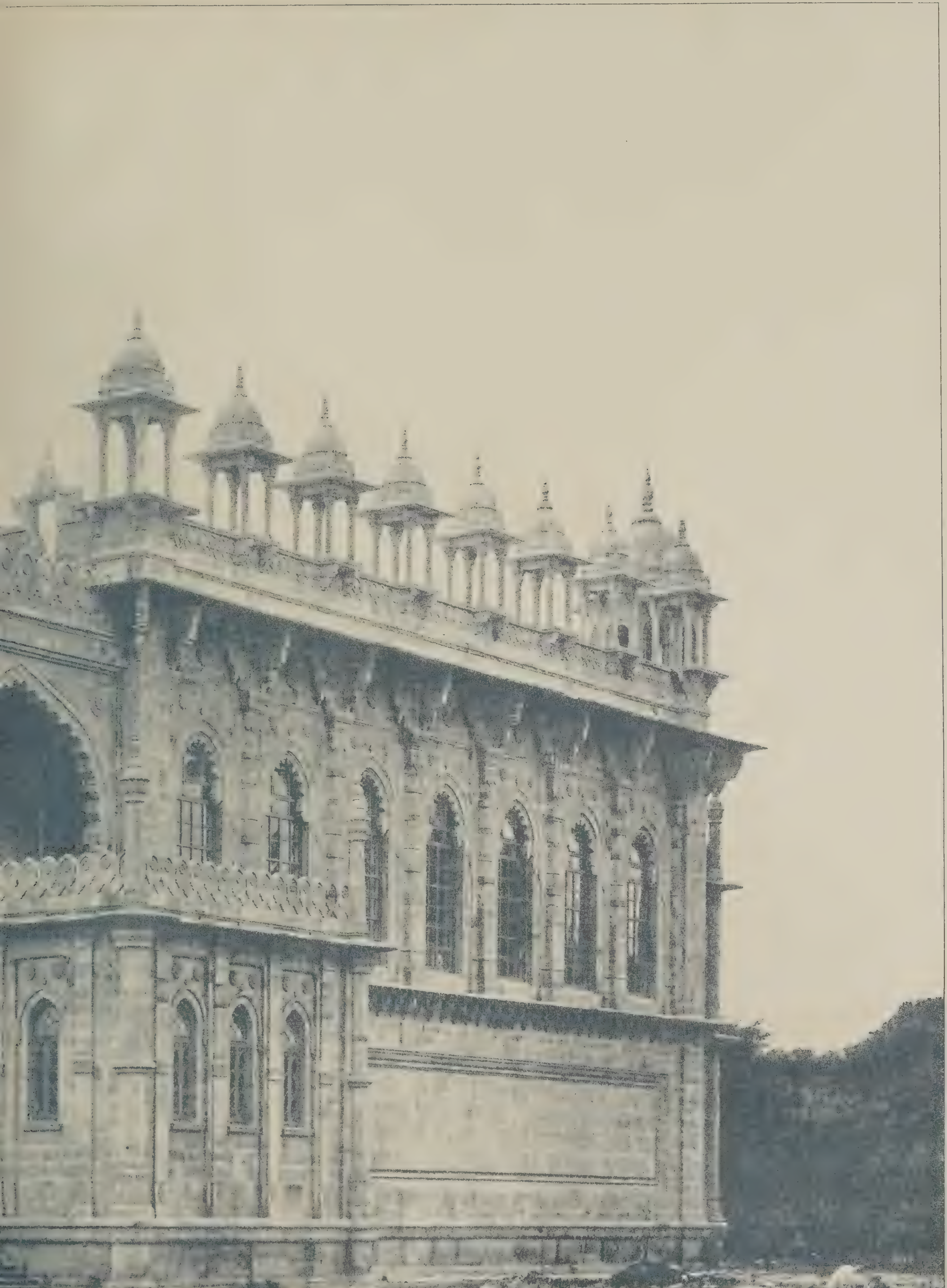


THE VICTORIA

HENRY



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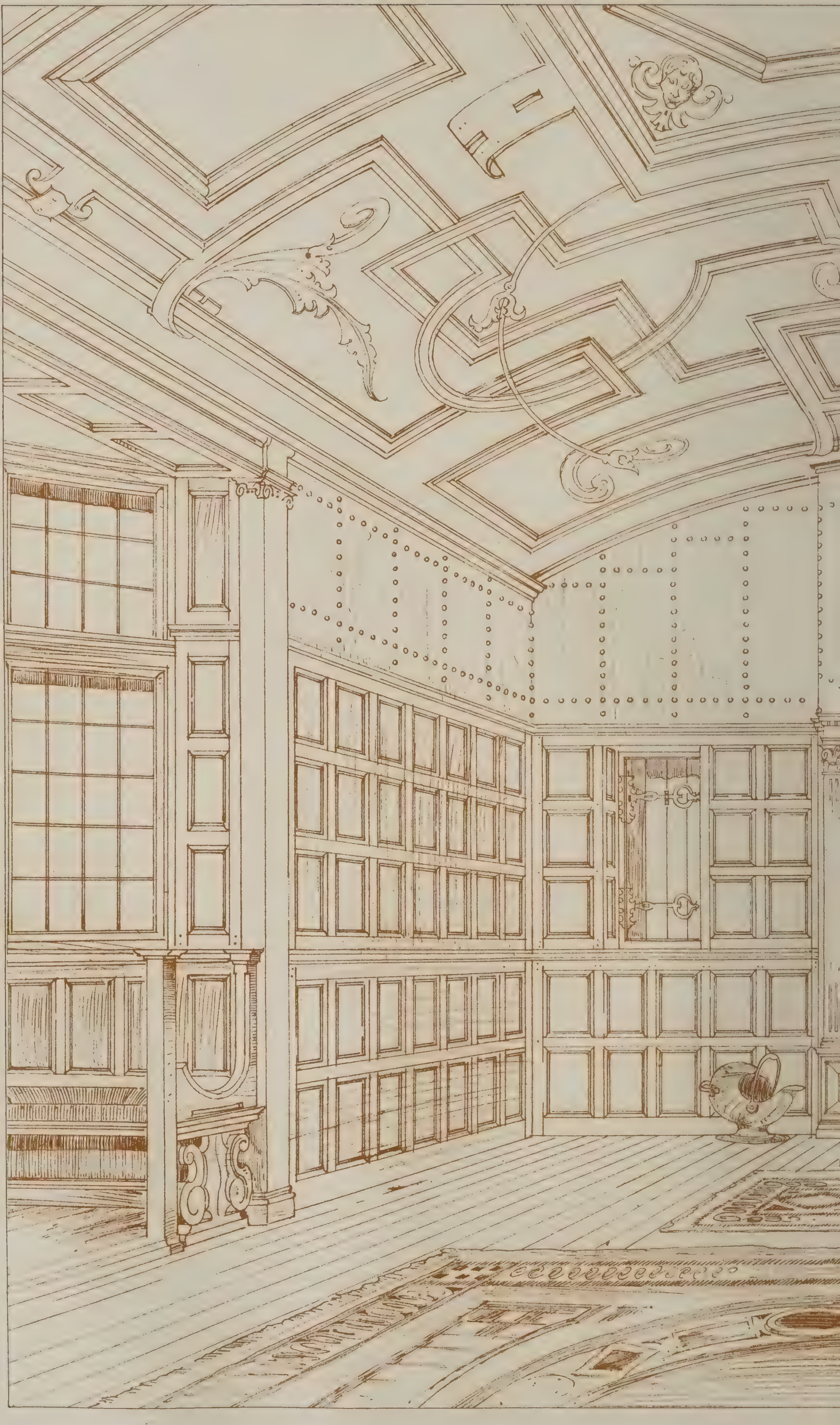
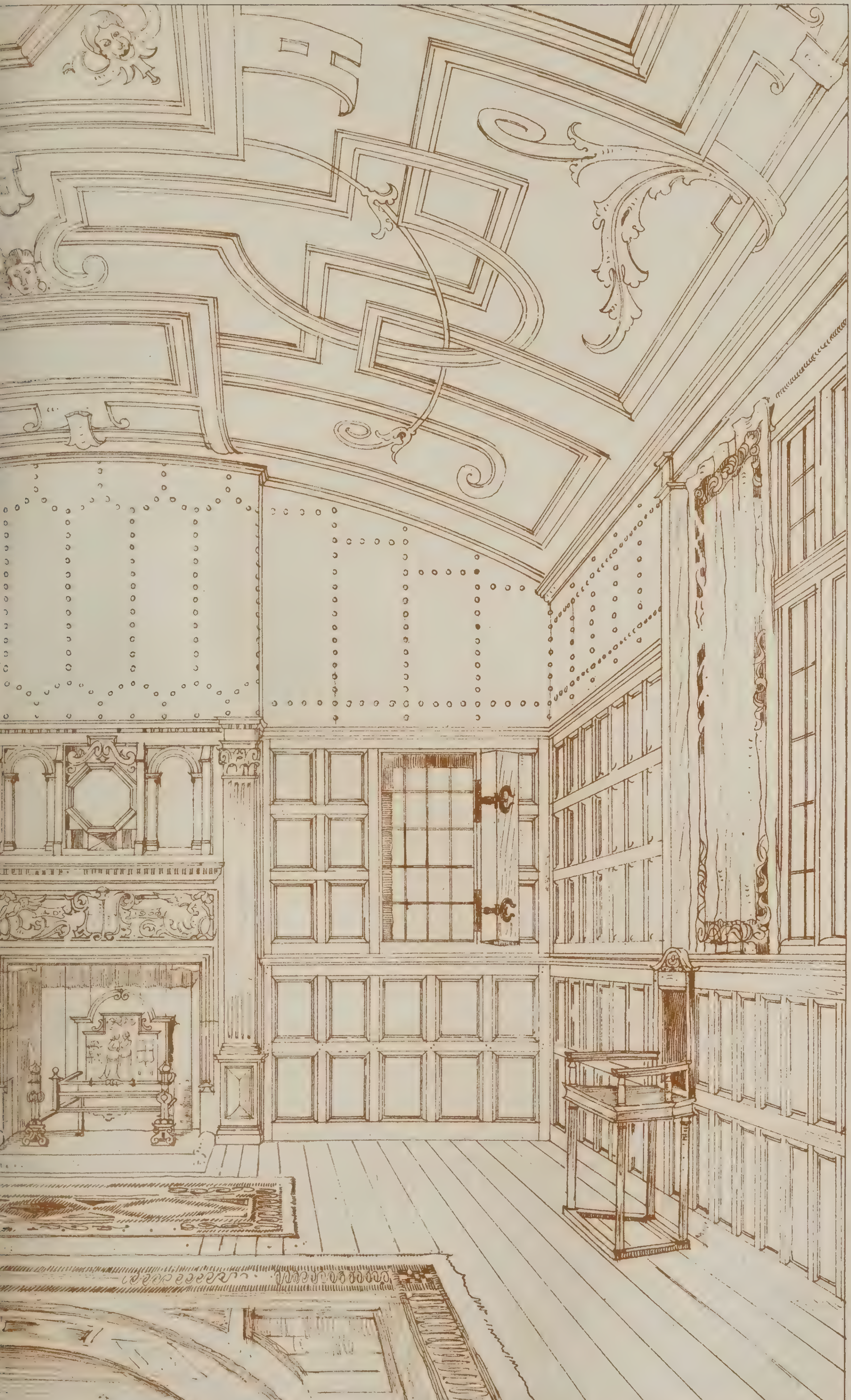


BILLIARD ROOM, "B

Messrs. HALL JONES



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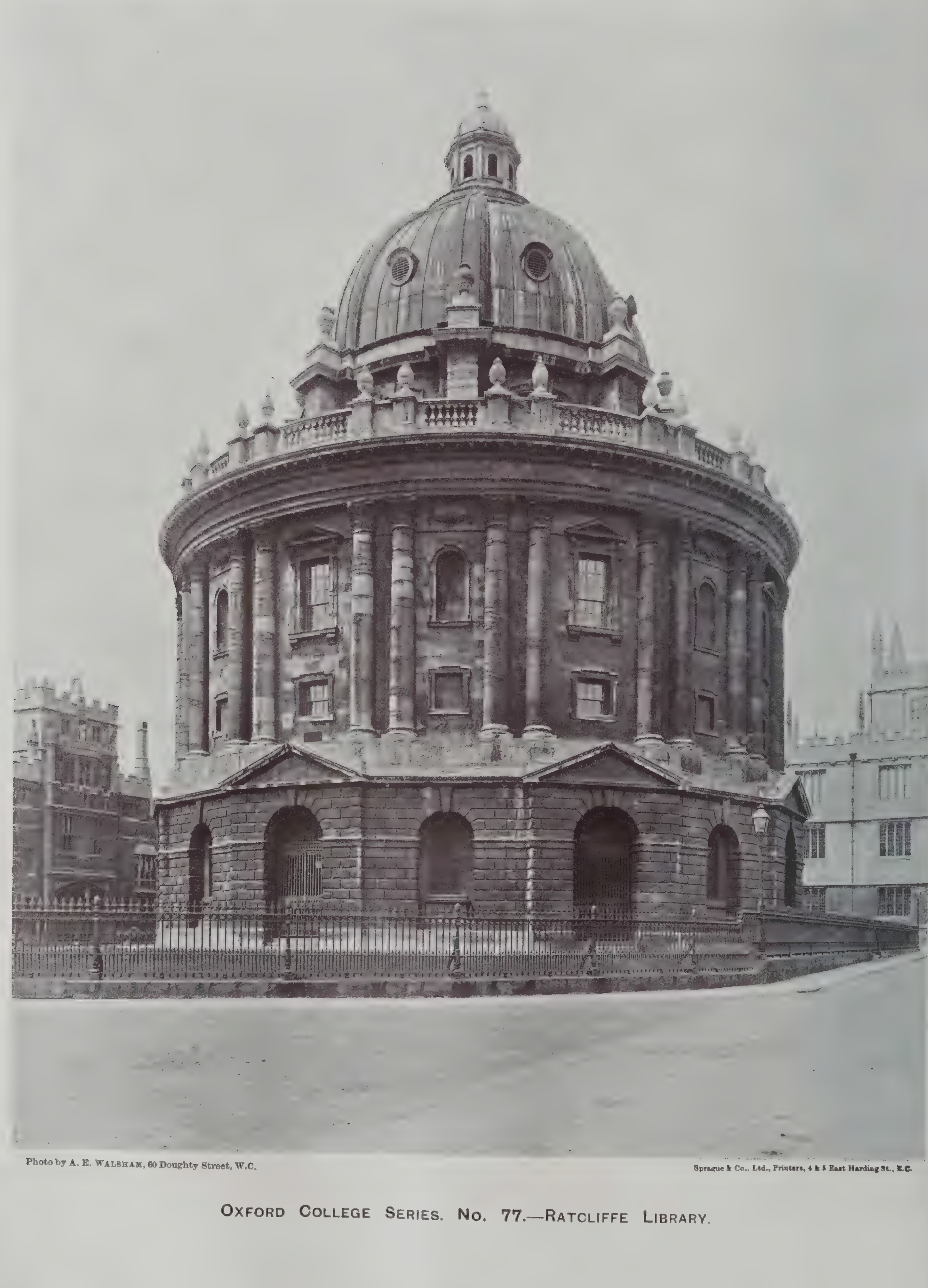

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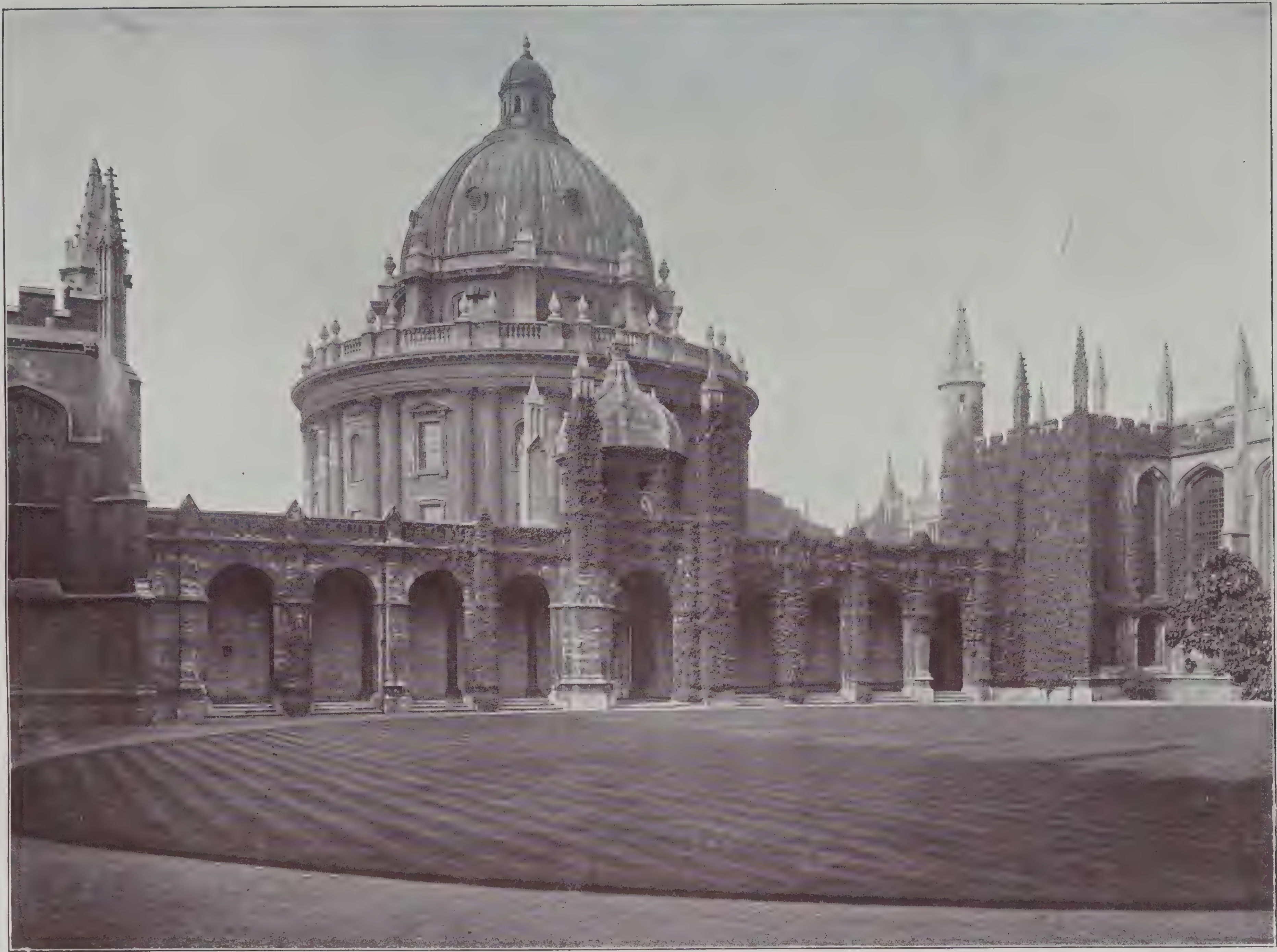

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THE

# Architect and Contract Reporter.

FRIDAY, JANUARY 7, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 COLMORE ROW.

*** *Entered in the United States of America as second-class matter.*

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*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

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## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

IRELAND.—Jan. 31.—The Pembroke Urban District Council, Co. Dublin, invite schemes and estimates for laying out Herbert Park (35 acres). Mr. J. C. Manly, Clerk, Town Hall, Pembroke, Co. Dublin.

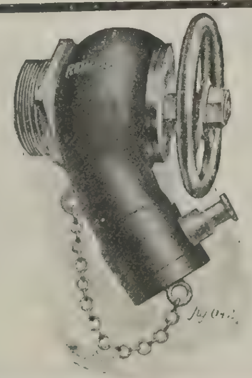
KEIGHLEY.—Jan. 15.—The education committee invite local architects to submit designs and estimates by above date for an elementary school at Highfield. Mr. H. Midgley, Secretary, Education Offices, Keighley.

LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l.* and 5*l.* Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



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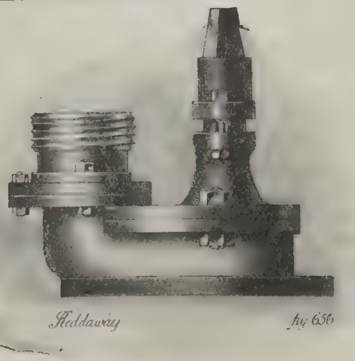

## CONTRACTS OPEN.

Berwick-upon-Tweed.—Jan. 10.—For mason, joiner, slater and plumber work of proposed additions to farm offices on Folly Farm. Messrs. J. Stevenson & Son, architects, 14 North Terrace, Berwick-on-Tweed.

Bridgwater.—Jan. 11.—For erection of United Methodist Church and schools. Mr. W. Hugill Dinsley, architect, Chorley, Lancs.

Brighton.—Jan. 13.—For the erection of an additional office for police purposes, on a portion of the forecourt at the north-east corner of the town hall. The Borough Surveyor, Town Hall, Brighton.

Brighton.—Jan. 14.—For carrying out certain alterations to the sanitary arrangements of the lavatories at the West Street Shelter Hall. The Borough Surveyor, Town Hall, Brighton.

Brown Edge.—Jan. 14.—For erection and completion of a Council school for 100 infants at Brown Edge, in the parish of Norton-in-the-Moors, Staffordshire. Deposit 1*l.* 1*s.* Apply to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Callington.—Jan. 8.—For erection of a workshop and cycle shed at the Callington County school, Cornwall. Mr. J. Sansom, architect, Liskeard.

Chelmsford.—Jan. 17.—For erection of an elementary school at Trinity Road, Springfield. Deposit 2*l.* Messrs. Chas. & W. H. Pertwee, architects, Chelmsford.

Dorchester.—Jan. 21.—For carrying out repairs, alterations and additions at Stratton Manor, High West Street, Dorchester, in order to adapt the premises as county offices. The County Surveyor's Office, Shire Hall, Dorchester.

Erpingham.—Jan. 15.—For the following works at Overstrand, Norfolk, viz., the construction of a new road, sea wall, and gangway approach to the beach. The Post Office, Overstrand, near Cromer.

Flixton.—Jan. 17.—For erection of an elementary school at Flixton, near Manchester, to accommodate 370 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Enfield.—Jan. 17.—For construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, for the Metropolitan Water Board. The Chief Engineer, Savoy Court, W.C. Deposit 10*l.* with the Accountant at Savoy Court, Strand, W.C.

Essington.—Jan. 14.—For erection and completion of a Council school for 130 infants at Essington, near Wolverhampton. Deposit 1*l.* 1*s.* Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Gosport.—Jan. 13.—For erection and completion of public conveniences, &c. The Surveyor's Office, the Gosport and Alverstoke Urban District Council, Gosport.

Halifax.—Jan. 12.—For the enlargement of the Halifax Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, S.W.

Halifax.—Jan. 13.—For various works required in erection of business premises in Harrison Road. Mr. J. T. Dalton, Victoria Street East, Halifax.

Halifax.—Jan. 26.—For the reinstating of Kingston Confectionery Works. Messrs. Medley Hall & Sons, architects and surveyors, 1 Harrison Road, Halifax.

Hinckley.—For erection of additions to Messrs. S. Davis & Sons' factory. Apply to Messrs. Heaton & Walker, architects and surveyors, 3 The Borough, Hinckley.

Ireland.—Jan. 10.—For the building of twenty labourers' cottages at Kilcoole, co. Wicklow, for the Rathdrum Rural District Council. Deposit 1*l.* 1*s.* Mr. George T. Moore, C.E., engineer and architect, 1 and 2 Foster Place, College Green, Dublin.

Ireland.—Jan. 13.—For additions and alterations to the Hibernian Bank premises at Tubercurry, co. Sligo. Mr. Edward J. Toye, architect, Northern Gate, Londonderry.

London.—Jan. 11.—The Great Western Railway Company are prepared to receive tenders for corrugated iron roofing work at Paddington goods' station. The Office of the Engineer, Paddington Station, London.

London.—Jan. 17.—For the re-appropriation of A.S.C. Block and erection of additions to provide accommodation for the Royal Army Medical Corps, Millbank, S.W. Deposit 10*l.* Apply by Jan. 7 the office of the Director of Barrack Construction, 80 Pall Mall, London, S.W.

Lydgate.—For the whole of the works required in erection of a pump house and elevated brick water tower at Lydgate. Deposit 1*l.* 1*s.* Mr. Fred J. Dixon, A.M.I.C.E., water engineer, Town Hall Chambers, Ashton-under-Lyne.

Macclesfield.—Jan. 18.—For the erection of a detached villa for private patients at Parkside Asylum. Deposit 2*l.* Mr. H. Beswick, county architect, Chester.

Malton.—Jan. 12.—For erection of new post office at Malton. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

Manchester.—Jan. 13.—For alterations to premises in High Street and Smithfield Market. Deposit 1*l.* 1*s.* The City Architect's Office, Town Hall, Manchester.

Natland.—Jan. 22.—Tenders are invited, either in whole or separate trade contracts, for erection of proposed residence, Natland, Kendal. Mr. John F. Curwen, F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Northwich.—Jan. 15.—For erection of school to accommodate 350 children, at Northwich Darwin Street. Deposit 1*l.* 1*s.* Apply after December 28 at the Education Office, Verdin Technical school, Northwich.

Nottingham.—Jan. 10.—For erection of a urinal and a store shed on the Nottingham Forest. Deposit 1*l.* 1*s.* Mr. Frank B. Lewis, city architect, Guildhall, Nottingham.

Okehampton.—Jan. 17.—For new higher elementary school for 120 children, with laboratory, cooking, and manual training rooms, at Okehampton, Devon. Deposit 1*l.* 1*s.* The County Architect (education), 1 Richmond Road, Exeter.

Oldham.—Jan. 19.—For the reconstruction of roof over gentlemen's swimming baths at Central Baths. The Borough Surveyor's Office, Oldham.

Pettaugh.—Feb. 7.—For erection of a new school for about 60 children at Pettaugh, near Stowmarket. Deposit 1*l.* 1*s.* Send names to Mr. W. E. Watkins, secretary, Education Office, County Hall, Ipswich.

Ryhope.—Jan. 11.—The Durham County Council invite sole tenders for a secondary school at Ryhope. Mr. W. Rushworth, Shire Hall, Durham.

Scotland.—Jan. 14.—For mason, brick, joiner, plumber, plasterer, slater, and heating works of proposed South school in High Street, Lochgelly. Deposit 1*l.* 1*s.* Messrs. A. Scobie & Son, architects, Dunfermline and Lochgelly.

Skipton.—Jan. 11.—For the masonry work required in the reconstruction of Pinder bridge. Deposit 1*l.* The Surveyor's Office, Town Hall, Skipton.

South Farnborough.—Jan. 10.—For erection of a county school for 570 children at South Farnborough, Hants. Deposit 5*l.* 5*s.* Apply after December 28 to Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Spennymoor.—Jan. 18.—For the erection of a higher elementary school. Mr. W. Rushworth, Shire Hall, Durham.

Stanley.—For erection of a roller skating rink. Mr. Thos. E. Crossling, architect and surveyor, Front Street, Stanley, S.O., co. Durham.

Stockport.—Jan. 10.—For the labour and materials required in erecting a wooden floor over a plunge bath at the St. Petersgate Baths. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

Talkin.—Jan. 17.—For repairs to school and house, for the managers of Talkin school. Mr. R. Routledge, Talkin, near Carlisle.

Wakefield.—Jan. 21.—For alterations and additions, builder, joiner, slater, plumber, plasterer, painter, asphalter, heating engineer, at Oxenhope Horkinstone Provided school. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

Wales.—Jan. 10.—For alterations and additions to the farm house and farm buildings at Highfield, near Llantwit Major, Glamorgan. The County Police Station, Llantwit Major, and at the Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—Jan. 11.—For alterations and additions to the goods shed at High Street, Swansea, for the Great Western Railway Company. The Engineer at Neath Station.

Wales.—Jan. 11.—For pulling down existing buildings and erection on the present site of a new headquarters station, at Pontypool police station, Monmouthshire. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Pontypool, Mon.

Wales.—Jan. 12.—For the following works for the Glamorgan County Council, viz. :—(1) New Council school for infants at Llest, Pontyrhyl ; (2) new mixed department at the Council school at Sandfields, Aberavon ; (3) new offices at

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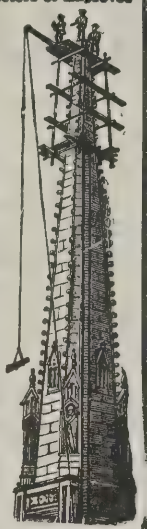

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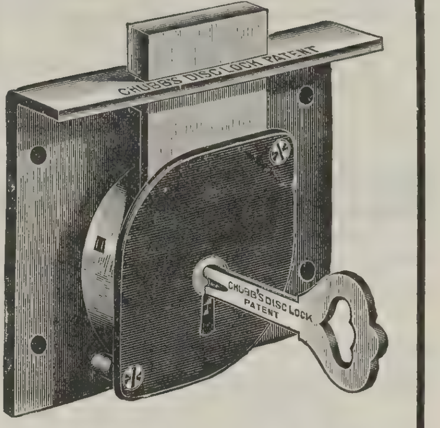

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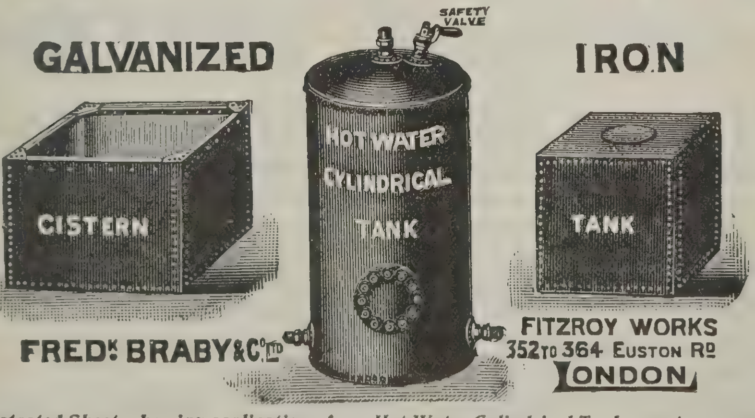

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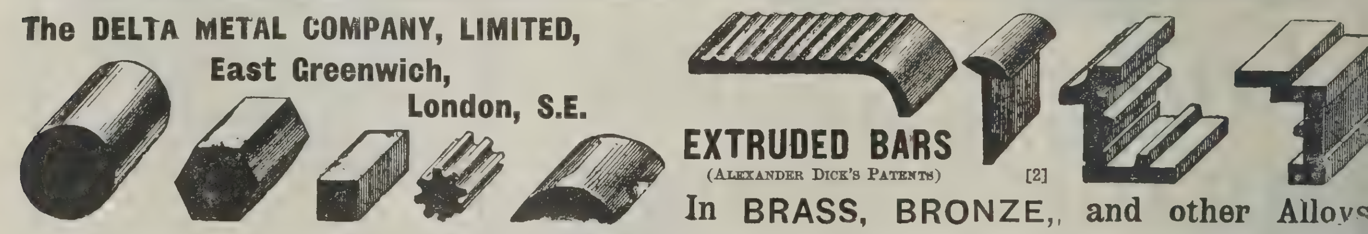
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WALES.—Jan. 14.—For sixteen large villas, proposed to be erected on the Eglwysilan Road, Pontypridd, for the Tygwyn Villa Building Club, Pontypridd. Deposit 2*l.* 2*s.* Send names by January 8 to Messrs. T. Richards & Kaye, architects and surveyors, Pontypridd.

WALES.—Jan. 15.—For erection of a public hall and institute at Briton Ferry. Deposit 3*l.* 3*s.* Send names by January 10 to Mr. H. Alex. Clarke, architect, Briton Ferry.

WALES.—Jan. 15.—For works of improvement and alterations to the Hafod Council school and out-offices, and for proposed new water-supply. Deposit 1*l.* 1*s.* The County Education Offices, Newtown, Montgomery.

WALES.—Jan. 17.—For erection of a cottage hospital at Pontypridd. Deposit 2*l.* 2*s.* Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

WALES.—Jan. 20.—For the extension of Bethany English Baptist Chapel, Treherbert, Rhondda Valley. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

WALES.—Jan. 21.—For erection and completion of three houses at Pentre. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

WIGMORE.—Jan. 13.—For new floors, partitions, dual desks, and ventilating hoppers in windows, &c., at the Walsall and West Bromwich District schools, Wigmore, West Bromwich. Mr. J. W. Allen, architect, High Street, West Bromwich.

WOOLWICH.—Jan. 19.—The Council of the Metropolitan Borough of Woolwich invite tenders for painting and repairs at the Public Library, High Street, Eltham. Mr. J. Rush Dixon, M.I.C.E., borough engineer, Town Hall, Woolwich.

WORKINGTON.—Jan. 14.—For the demolition of the Queen's Arms and adjoining cottages, King Street, and rebuilding of the inn on the site. Mr. Edwin J. Knight, secretary and manager, Messrs. Thomas Salt & Co., Ltd., brewers, High Street, Burton-on-Trent.

YORKSHIRE.—Jan. 10.—For the following works for the East Riding of Yorkshire education committee, viz. :— (*a*) Erection of a Council school to accommodate 133 children, and teacher's house, at Stamford Bridge ; (*b*) alterations and additions to the Council school at Burton Pidsea. The Building Surveyor, County Hall, Beverley.

MR. J. R. FINDLAY, burgh surveyor, Leith, in his annual report, states that depression in the building trade still continues, although the year just closing shows a slight improvement on the previous two years. The estimated value of buildings for which warrants were granted was 61,272*l.*, as compared with 56,200*l.* in 1908, 58,674*l.* in 1907, 179,000*l.* in 1906, and 92,000*l.* in 1905.

THE WOOD TRADE OF DANTZIG.—The British Consul at Dantzig reports that, in spite of low freights, the position of those engaged in the wood trade in 1908 was worse than it has been for some time past. There are many explanations of this state of things. In the first place, in spite of the reduced bank rate, Dantzig banking firms have become alarmed by the large failures of the year before, and were exceedingly cautious in giving credit to timber merchants. Among other causes of depression, the strike in the British shipbuilding trade was of importance, several orders that had been expected being after all not placed on account of it. Perhaps, however, the simplest reason for slackness of business was that the railway companies, both in Germany and other countries, finding their takings reduced through diminished traffic, were obliged in consequence to restrict their usual orders for redwood timber, timber ends, and sleepers. The supply of sleepers was, in fact, smaller than in 1907, the large stocks remaining over from that year having caused a fall in prices which discouraged foreign timber merchants from sending their wood to Dantzig. It is, moreover, to be noted that the Russian home demand for wood is constantly on the increase, and this no doubt contributed to a shortage in the Dantzig supply. The condition of the building trade further aggravated the situation. Where any activity for a time prevailed, the competition to supply materials became so keen that falling prices ruled everywhere. In every branch of the wood trade, in fact, the prices had a downward tendency, and were in some cases actually lower than the original cost of production. One satisfactory fact may, however, be noted. The year 1908, though a bad one, was at the same time free from any violent crisis, such as that which was seen the year before. No failures were reported.

# TENDERS.

## CHESTER-LE-STREET.

For making up 15 private streets at Birtley for the Chester-le-Street Rural District Council. Mr. G. W. AYTON, surveyor.

Jos. Burnett & Son, section 1 (*accepted*), 871*l.* 2*s.* 8*d.* ; section 2, 524*l.* 7*s.* 8*d.* ; drains, 113*l.* 19*s.* ; J. W. Henderson, section 1, 894*l.* 11*s.* 6*d.* ; section 2, 429*l.* 14*s.* 8*d.* ; drains, 113*l.* 3*s.* (*accepted*). Geo. E. Simpson, section 1, 922*l.* 18*s.* 5*d.* ; section 2, 451*l.* 0*s.* 5*d.* ; drains, 122*l.* 10*s.* J. W. White, section 1, 960*l.* 15*s.* 10*d.* ; section 2, 435*l.* 7*s.* 2*d.* ; drains, 122*l.* J. Thompson & Son, section 1, 970*l.* 17*s.* 10*d.* ; section 2, 514*l.* 17*s.* 8*d.* ; drains, 141*l.* 7*s.* 6*d.* J. Carrick, section 1, 1,033*l.* 14*s.* 6*d.* ; section 2, 529*l.* 10*s.* 6*d.* ; drains, 94*l.* 4*s.* 3*d.* R. Hudson & Sons, section 1, 1,078*l.* 2*s.* 11*d.* ; section 2, 512*l.* 12*s.* 11*d.* ; drains, 126*l.* 18*s.* J. Hope, section 1, 1,099*l.* 10*s.* 2*d.* ; section 2, 544*l.* 2*s.* 8*d.* ; drains, 128*l.* 16*s.* 1*d.* J. W. Robson, section 1, 1,099*l.* 17*s.* 5*d.* ; section 2, 464*l.* 2*s.* 3*d.* ; drains, 127*l.* 2*s.* 2*d.* Geo. Pickering, section 1, 1,123*l.* 19*s.* 6*d.* ; section 2, 483*l.* 8*s.* 4*d.* ; drains, 132*l.* 16*s.* 8*d.* J. Clark & Son, section 1, 1,154*l.* 3*s.* 2*d.* ; section 2, 475*l.* 1*s.* ; drains, 114*l.* 5*s.* 5*d.* C. S. Bunch, section 1, 1,192*l.* 12*s.* 11*d* ; section 2, 526*l.* 11*s.* 8*d.* ; drains, 124*l.* 7*s.* 9*d.* It was decided to let the work in two sections, and the surface water drains to go with each section according to schedule of prices.—N.B.—Burnett accepted for section 1 ; Henderson accepted for section 2.

For private street works at New Washington, for the Chester-le-Street Rural District Council. Mr. G. W. AYTON, surveyor.

| | | | |
|---|---|---|---|
| Trainer | £3,020 | 5 | 0 |
| Carrick | 2,720 | 9 | 0 |
| Hudson | 2,640 | 1 | 4 |
| Hope | 2,466 | 8 | 1 |
| White | 2,366 | 0 | 0 |
| Bunch | 2,356 | 12 | 6 |
| Clarke & Sons | 2,348 | 5 | 5 |
| Simpson | 2,298 | 17 | 8 |
| Henderson | 2,287 | 10 | 0 |
| Robson | 2,265 | 6 | 10 |
| FISHER (*accepted*) | 2,080 | 13 | 5 |

## DRIFFIELD.

For erection of residence in St. John's Road. Mr. MAURICE B. PARKIN, architect, Bridlington.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Martindale, brickwork, &c. | £232 | 0 | 0 |
| Julian, carpenter and joiner | 114 | 0 | 0 |
| Knaggs, plumbing and painting | 39 | 10 | 0 |
| Dawber, Townsley & Co., tiling | 27 | 0 | 0 |

## EXETER.

For the erection of school buildings, new day-room for girls' department, and other works, at the West of England Institution for Blind. Mr. JAMES JERMAN, F.R.I.B.A., Exeter.

| | | | |
|---|---|---|---|
| Wakeham Bros. | £1,567 | 0 | 0 |
| Mudge | 1,375 | 0 | 0 |
| Ham & Passmore | 1,253 | 0 | 0 |
| Oliver & Sons | 1,231 | 0 | 0 |
| Woodman & Son | 1,228 | 15 | 9 |
| Baker Bros. | 1,200 | 0 | 0 |
| M. T. Sleeman | 1,154 | 0 | 0 |
| Coles | 1,149 | 0 | 0 |
| Brealy | 1,147 | 0 | 0 |
| Stephens & Vaughan | 1,101 | 0 | 0 |
| F. E. Sleeman | 1,088 | 0 | 0 |
| Herbert | 1,030 | 0 | 0 |
| Bunclark | 1,030 | 0 | 0 |
| Setter | 1,014 | 0 | 0 |
| HARVEY, Exeter (*accepted*) | 995 | 0 | 0 |

## FENTON.

For extensions to manufactory, for the Rubian Pottery Company. Mr. R. T. LONGDEN, architect, Burslem.

| | | | |
|---|---|---|---|
| Caulcott | £1,159 | 0 | 0 |
| Cummings | 986 | 0 | 0 |
| Tompkinson & Bettelley | 975 | 0 | 0 |
| Ball & Robinson | 935 | 0 | 0 |
| J. Cooke | 925 | 0 | 0 |
| Grant & Sons | 910 | 0 | 0 |
| Warrilow | 905 | 0 | 0 |
| Beckett | 900 | 0 | 0 |
| Meiklejohn & Son | 885 | 0 | 0 |

### FENTON—*continued.*

| | | | |
|---|---|---|---|
| W. Cooke | 878 | 0 | 0 |
| Walters | 875 | 0 | 0 |
| Thomas & Son | 853 | 0 | 0 |
| Howlett | 840 | 0 | 0 |
| Broadhurst & Sons | 829 | 10 | 0 |
| Young & Son | 825 | 0 | 0 |
| Boston | 800 | 0 | 0 |
| Heath, Basford (*accepted*) | 750 | 0 | 0 |

### IRELAND.

For sewerage works, for the Newtownards Urban District Council. Messrs Swiney & Croasdaile, engineers, Belfast.

| | | | |
|---|---|---|---|
| J. & R. Thompson, Belfast (*accepted*) | £12,398 | 0 | 0 |

For erection of board-room, offices, &c., at Rathdown.

| | | | |
|---|---|---|---|
| Mosley, Bray (*accepted*) | £860 | 0 | 0 |

For erection of a Carnegie library at Clondalkin, South Dublin.

| | | | |
|---|---|---|---|
| Clarke, Dublin (*accepted*) | £1,375 | 0 | 0 |

### LEEDS.

For erecting a billiard-room to the North Ward Liberal Club. Mr. J. W. Thackray, architect, Leeds.

| | | | |
|---|---|---|---|
| Myers & Sons | £397 | 0 | 0 |
| Best | 396 | 0 | 0 |
| Wood | 386 | 10 | 0 |
| Milnes | 380 | 0 | 0 |
| Higgins | 375 | 0 | 0 |
| Pickard | 373 | 0 | 0 |
| Dews & Co. | 369 | 0 | 0 |
| Mason & Sons | 360 | 0 | 0 |
| Thompson & Sons | 352 | 0 | 0 |
| Walton & Sons | 350 | 0 | 0 |
| Morley & Sons, Leeds (*accepted*) | 348 | 0 | 0 |

### LIVERPOOL.

For alterations on the ground floor of the Walker Art Gallery.

| | | | |
|---|---|---|---|
| Brown & Backhouse (*recommended*) | £220 | 0 | 0 |

For remodelling heating arrangements of the four front rooms on the ground floor of the Walker Art Gallery.

| | | | |
|---|---|---|---|
| Cooper & Sons (*recommended*) | £122 | 10 | 0 |

### MARYPORT.

For water supply works (gravitation mains, filters, &c.), for the Urban District Council. Mr. J. C. Boyd, A.M.Inst.C.E., Carlisle.

| | | | |
|---|---|---|---|
| Mandle & Co. | £15,625 | 0 | 0 |
| Dawson | 14,147 | 14 | 4 |
| Nunn & Co. | 12,435 | 8 | 0 |
| Gilfeather & Beaty | 11,684 | 12 | 5 |
| Gibson | 11,523 | 16 | 8 |
| Arnold & Son | 11,463 | 15 | 1 |
| Mackay | 11,182 | 3 | 9 |
| Crawford | 11,174 | 15 | 3 |
| Laing & Son | 11,097 | 7 | 10 |
| Wickstead & Co. | 10,952 | 11 | 0 |
| Jackson | 10,849 | 16 | 0 |
| Deakin | 10,837 | 1 | 10 |
| Brebner & Co. | 10,608 | 0 | 5 |
| Bushby & Sons, Leeds (*accepted*) | 10,586 | 16 | 9 |

### NEWTON ABBOT.

For erection and completion of the following works, for the Urban District Council, viz.:—(*a*) Boundary walls, gates, and railings, &c.; contract No. 1. (*b*) Sexton's lodge, store, &c.; contract No. 2. (*c*) Mortuary chapel; contract No. 3; at the new cemetery, Wolborough. Mr. C. D. White, the Surveyor's Office, Newton Abbot.

*For Boundary Walls, Gates, and Railings.*

| | | | |
|---|---|---|---|
| Pomeroy | £1,977 | 0 | 0 |
| Parker Bros. | 1,622 | 0 | 0 |
| Stacey | 1,530 | 0 | 0 |
| Bearne, Newton Abbot (*accepted*) | 1,424 | 0 | 0 |
| Jackman | 1,386 | 0 | 0 |

*For Mortuary Chapel.*

| | | | |
|---|---|---|---|
| Pomeroy | 1,001 | 0 | 0 |
| Parker Bros. | 915 | 0 | 0 |
| Stacey | 910 | 0 | 0 |
| Bearne (*accepted*) | 788 | 0 | 0 |
| Jackman | 777 | 0 | 0 |

*For Lodge and Stores.*

| | | | |
|---|---|---|---|
| Pomeroy | 814 | 0 | 0 |
| Parker Bros. | 517 | 0 | 0 |
| Stacey | 496 | 0 | 0 |
| Jackman | 497 | 0 | 0 |
| Bearne (*accepted*) | 488 | 0 | 0 |

### PUDSEY.

For erecting new infant school in connection with the Primrose Hill School. Mr. C. S. Nelson, architect, Leeds.

*Accepted tenders.*

Kendall & Co., mason and bricklayer, Pudsey.
Hargrave, joiner, Pudsey.
Walker, plumber, Pudsey.
Wood & Williams, plasterers, Pudsey.
Thompson, slater, Stanningley.
Nicholson, painter, Pudsey.
Total, £1,913 7*s.* 8*d.*

### ROWSLEY.

For erection of a Primitive Methodist church and school at Rowsley, Darley Dale. Mr. D. M. Wildgoose, architect, Matlock.

| | | | |
|---|---|---|---|
| Kirk | £1,215 | 0 | 0 |
| Twyford & Son | 1,190 | 17 | 0 |
| Clark | 1,161 | 4 | 0 |
| Toft | 1,101 | 15 | 0 |
| Nuttall | 1,069 | 6 | 7 |
| Evans | 1,024 | 10 | 3 |
| Toft & Co. | 1,010 | 5 | 0 |
| Wildgoose, Matlock (*accepted*) | 969 | 5 | 0 |

### WALES.

For erecting temporary dormitories, &c., at the Union Workhouse, Merthyr Tydfil. Mr. T. Roderick, architect, Aberdare.

| | | | |
|---|---|---|---|
| Davies & Sons | £1,760 | 0 | 0 |
| Jenkins | 1,398 | 15 | 9 |
| Sullivan | 1,365 | 12 | 0 |
| James | 1,346 | 0 | 0 |
| Williams, Merthyr Tydfil (*accepted*) | 1,345 | 19 | 0 |
| W. & J. R. Watson | 1,298 | 0 | 0 |

For erection of a (girls') Council school for 308 scholars, at Gilfach Fargoed, Glamorgan. Mr. D. Pugh-Jones, county architect, Cardiff.

| | | | |
|---|---|---|---|
| Williams, Cardiff (*accepted*) | £3,892 | 0 | 0 |

### WARRINGTON.

For rebuilding the bridge and the construction of four walls.

| | | | |
|---|---|---|---|
| Thorne & Sons, Westminster (*accepted*) | £14,310 | 0 | 0 |

### WEYMOUTH.

For work to be done at the R.G.A. Drill Hall, Weymouth. Mr. S. Jackson, M.S.A., architect and surveyor, Weymouth.

| | | | |
|---|---|---|---|
| Bowring | £168 | 0 | 0 |
| Holmes & Bridgeman | 164 | 17 | 6 |
| Groves & Wills | 134 | 0 | 0 |
| Parsons | 133 | 8 | 0 |
| Knell & Sons, Weymouth (*accepted*) | 130 | 10 | 0 |

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Mr. A. D. Rowe, architect to the Worcestershire County Council and standing, joint and education committees, died last week from heart failure. Mr. Rowe and members of the family have designed many important buildings in the city and county.

Mr. R. T. Blomfield, A.R.A., will commence his Royal Academy lectures on architecture on February 14. The titles of the four lectures are as follows:—(1) Philibert de l'Orme; (2) Jean Bullant; (3) Pierre Lescot and Jean Goujon; (4) French Sculpture in the Sixteenth Century. The lectures on painting will this year be given by Sir W. B. Richmond, R.A., K.C.B., who held the Professorship from 1895 to 1899. His course is entitled "Design and Drawing," and begins on January 13. Mr. W. R. Colton, A.R.A., will again lecture on sculpture.

A new synagogue is to be erected in Commercial Road, E., to accommodate a thousand persons, in place of the synagogue in St. Mary Axe. The joint architects are Mr. Lewis Solomon, F.R.I.B.A., and Mr. Fred Marks, F.R.I.B.A.

The York Corporation have approved the race committee's plan for new stands, subject to the owners undertaking, at their own cost, to test one bay of the stands with a load of 2 cwt. per foot super; such test to be carried out in the presence of, and to the satisfaction of, the City Surveyor or his representative, and prior to the building being brought into use by the public.

Messrs. Lever Brothers, Ltd., of Port Sunlight, have decided to establish a factory at Durban, Natal. Estimates have been received and considered, but the ultimate dimensions of the factory will depend on the growth of the business in South Africa. Building operations will be commenced as soon as possible.

# TENDERS FOR THE YEAR 1909.

THE following are a few of the more important works of which the tenders appeared in our columns in the course of 1909:—

## BETHNAL GREEN.

For municipal buildings for Bethnal Green Borough Council. Mr. E. E. FINCH, borough engineer and surveyor, Bethnal Green, N.E.

| | | | |
|---|---|---|---|
| Wall | £29,700 | 0 | 9 |
| Appleby & Sons | 29,225 | 0 | 0 |
| Nicholson & Son | 28,571 | 13 | 11 |
| Spencer, Santo & Co. | 27,412 | 0 | 0 |
| Parker & Sons | 27,174 | 0 | 0 |
| Nightingale | 27,078 | 0 | 0 |
| McCormick & Sons | 26,942 | 0 | 0 |
| Todd & Newman | 26,900 | 0 | 0 |
| Higgs & Hill | 26,460 | 0 | 0 |
| Holloway | 26,387 | 0 | 0 |
| Stapleton & Sons | 26,350 | 0 | 0 |
| J. & M. Patrick | 26,273 | 0 | 0 |
| Hammond & Son | 26,257 | 0 | 0 |
| Pasterfield & English | 26,238 | 0 | 0 |
| Shurmur & Sons | 26,151 | 0 | 0 |
| Perry & Co. | 25,980 | 0 | 0 |
| Hammond & Miles | 25,831 | 1 | 0 |
| Monk | 25,827 | 0 | 0 |
| Coles | 25,808 | 0 | 0 |
| Allen & Sons | 25,784 | 0 | 0 |
| F. & G. Foster | 25,596 | 0 | 0 |
| Williams | 25,527 | 0 | 0 |
| Maddison | 25,449 | 0 | 0 |
| Armitage & Hodgson | 25,388 | 0 | 0 |
| Lawrence & Son | 25,278 | 0 | 0 |
| Kearley | 25,203 | 0 | 0 |
| Jerram | 25,197 | 0 | 0 |
| Pattinson & Son | 24,991 | 0 | 0 |
| Lowe & Co. | 24,900 | 0 | 0 |
| Minter | 24,490 | 0 | 0 |
| BRAND, PETTITT & Co., Tottenham (*accepted*) | 24,450 | 0 | 0 |
| Fryer & Co. | 23,407 | 3 | 9 |

## BRISTOL.

For main block of new buildings at Saithmead, for the Bristol School of Industry for the Blind. Messrs. EDMESTON & GABRIEL, architects, 42 Old Broad Street, E.C.

| | | | | Additional for Glazed Tiling. | | |
|---|---|---|---|---|---|---|
| Clark & Son | £27,440 | 0 | 0 | £650 | 0 | 0 |
| Perkins & Son | 26,150 | 0 | 0 | 700 | 0 | 0 |
| Downs & Son | 25,600 | 0 | 0 | 690 | 0 | 0 |
| Ridd | 25,450 | 0 | 0 | 710 | 0 | 0 |
| Walters & Son | 25,367 | 0 | 0 | 720 | 0 | 0 |
| Chancellor & Son | 25,366 | 0 | 0 | 683 | 0 | 0 |
| Stephens, Bastow & Co. | 24,949 | 0 | 0 | 700 | 0 | 0 |
| Long & Sons | 24,944 | 0 | 0 | 650 | 0 | 0 |
| Cowlin & Son | 24,928 | 0 | 0 | 711 | 0 | 0 |
| Love | 24,925 | 0 | 0 | 715 | 0 | 0 |
| Willcox & Co. | 24,875 | 0 | 0 | 750 | 0 | 0 |
| Hayes & Son | 23,912 | 0 | 0 | 708 | 0 | 0 |
| WILKINS & SON, Bristol (*accepted*) | 23,846 | 0 | 0 | 737 | 0 | 0 |
| Lovell & Son | 23,600 | 0 | 0 | 630 | 0 | 0 |

## CHRISTCHURCH.

For the works in connection with the sewerage scheme, for the Town Council.

| | | | |
|---|---|---|---|
| Brebner | £45,288 | 0 | 0 |
| Riley | 42,495 | 14 | 6 |
| Underwood | 41,375 | 15 | 6 |
| Neal | 41,283 | 0 | 0 |
| Mitchell & Son | 40,909 | 4 | 0 |
| J. & T. Binns | 40,678 | 3 | 9 |
| Buckley | 39,909 | 0 | 0 |
| Cochrane & Sons | 39,343 | 0 | 0 |
| Whyte & Co. | 38,970 | 7 | 9 |
| Bentley & Son | 38,467 | 1 | 7 |
| Wilkinson & Co. | 37,658 | 0 | 0 |
| Bell & Sons | 37,393 | 0 | 0 |
| A. G. Osenton | 37,163 | 12 | 8 |
| Merritt | 36,995 | 19 | 0 |
| Pethick Bros. | 36,551 | 0 | 0 |
| Price & Co. | 36,547 | 0 | 0 |
| Johnson & Langley | 35,976 | 10 | 0 |
| Nunn & Co. | 35,603 | 0 | 0 |
| Moran & Son | 35,398 | 5 | 6 |
| Wood & Sons | 35,355 | 19 | 0 |
| Pedrette | 34,813 | 2 | 10 |
| F. Osenton | 34,751 | 17 | 6 |
| Jesty & Baker | 34,731 | 14 | 0 |
| Macdonald | 34,682 | 0 | 0 |
| Osman | 34,517 | 10 | 0 |
| Mackay | 34,169 | 1 | 3 |
| Crockerell | 33,062 | 7 | 0 |
| COOPER & Co. (*accepted*) | 31,104 | 1 | 7 |

## COLCHESTER.

For erection and completion of the superstructure of the main building of the lunatic asylum at Mile End. Messrs. F. WHITMORE & W. H. TOUN, architects.

| | | | |
|---|---|---|---|
| McCormick & Sons | £212,632 | 0 | 0 |
| Bennett | 203,600 | 0 | 0 |
| Perry & Co. | 201,049 | 0 | 0 |
| Pattinson & Sons | 199,832 | 0 | 0 |
| Rowbotham | 196,392 | 0 | 0 |
| Allen & Sons | 195,590 | 0 | 0 |
| Lovatt | 195,186 | 0 | 0 |
| Arnold & Son | 192,500 | 0 | 0 |
| Byrom | 191,687 | 0 | 0 |
| Waring & White (1906) | 191,139 | 0 | 0 |
| Leslie & Co. | 190,403 | 0 | 0 |
| Bateman | 189.889 | 0 | 0 |
| KING & SON (*accepted*) | 189,691 | 0 | 0 |

## INDIA.

For a steel water tank with a holding capacity of 9,000,000 gallons, for the supply of water for domestic and other purposes to the city of Calcutta.

*English tenders.*

| | | | |
|---|---|---|---|
| Piggott & Co. | £160,000 | 0 | 0 |
| Whessoe Foundry Co. | 155,000 | 0 | 0 |
| Fraser & Son | 148,000 | 0 | 0 |
| Motherwell Bridge Co. | 142,000 | 0 | 0 |
| Westwood & Wright | 128,762 | 0 | 0 |
| Mayoh & Halley | 126,445 | 0 | 0 |
| Findlay & Co. | 108,500 | 0 | 0 |
| Newman | 108,000 | 0 | 0 |
| Heenan & Froude | 107,575 | 0 | 0 |
| C. & W. Walker | 100,608 | 0 | 0 |
| P. & W. M'Lellan | 97,450 | 0 | 0 |
| Cleveland Bridge and Engineering Co. | 91,880 | 0 | 0 |
| CLAYTON, SONS & Co., Leeds (*accepted*) | 91,367 | 0 | 0 |

## LONDON.

For intercepting sewer, Contract No. 1, Brent District drainage, for the Willesden District Council.

| | 6 ft. by 4 ft. | | | 5 ft. by 3 ft.4 in. | | |
|---|---|---|---|---|---|---|
| Dickson | £75,518 | 2 | 6 | £67,154 | 3 | 5 |
| Smith & Co. | 71,329 | 17 | 2 | 62,270 | 0 | 11 |
| Monk & Newell | 68,653 | 3 | 2 | 60,811 | 1 | 7 |
| Jackson | 66,989 | 12 | 2 | 59,698 | 11 | 2 |
| Adams | 66,340 | 10 | 0 | 57,975 | 2 | 4 |
| Latter | 65,200 | 12 | 3 | 56,936 | 5 | 9 |
| Pearson & Son | 64,467 | 0 | 8 | 58,613 | 2 | 11 |
| Wickstead & Beardsell | 63,181 | 9 | 9 | 57,094 | 11 | 9 |
| Nowell | 60,706 | 12 | 5 | 53,205 | 5 | 11 |
| Griffiths & Co. | 58,400 | 0 | 0 | 52,892 | 0 | 0 |
| Nowell & Sons | 57,884 | 6 | 9 | 52,032 | 3 | 9 |
| Bell & Sons | 57,821 | 0 | 0 | 50,796 | 0 | 0 |
| Shellabear & Sons | 57,595 | 13 | 6 | 53,095 | 5 | 2 |
| J. & T. Binns | 57,147 | 8 | 11 | 50,554 | 6 | 1 |
| Clements, Knowling & Co. | 56,453 | 0 | 0 | 49,552 | 0 | 0 |
| Price & Co. | 55,942 | 18 | 0 | 50,597 | 12 | 10 |
| Johnson & Langley | 55,045 | 0 | 2 | 48,190 | 0 | 1 |
| Westminster Construction Co. | 54,222 | 5 | 8 | 49,361 | 14 | 10 |
| Bower Bros. | 54,355 | 0 | 0 | 48,185 | 0 | 0 |
| McAlpine & Sons | 54,106 | 9 | 9 | 47,513 | 9 | 10 |
| Paterson | 53,823 | 0 | 2 | 47,826 | 14 | 11 |
| Muirhead & Co. | 53,781 | 6 | 7 | 48,630 | 14 | 11 |
| Macdonald & Deakin (*too late*) | 52,863 | 3 | 4 | 46,377 | 0 | 0 |
| Ford | 52,570 | 0 | 0 | 46,982 | 0 | 0 |
| Brebner & Co. | 52,262 | 1 | 10 | 46,258 | 9 | 4 |
| Moran & Son | 50,398 | 0 | 0 | 43,900 | 0 | 0 |
| Bentley & Son | 50,009 | 6 | 3 | 44,465 | 11 | 2 |
| UNDERWOOD & BRO., Dukinfield, Cheshire (*accepted*)* | *49,547 | 7 | 1 | 43,986 | 17 | 3 |
| Whyte & Co. | — | | | 50,808 | 14 | 5 |

### LONDON—*continued.*

For the construction of section 5 of the northern low-level sewer No. 2 between Grosvenor Crescent and Warwick Road.

| | | | |
|---|---|---|---|
| Price & Reeves | £207,036 | 16 | 11 |
| Scott & Middleton, Ltd. | 205,437 | 0 | 0 |
| Johnson & Langley | 198,667 | 11 | 6 |
| Bentley & Son | 187,453 | 12 | 3 |
| Kellett | 186,070 | 18 | 5 |
| Shellabear & Son | 185,433 | 13 | 5 |
| Pearson & Son | 183,147 | 18 | 6 |
| Cochrane & Sons | 182,698 | 6 | 2 |
| Mowlem & Co. | 177,782 | 0 | 0 |
| Nowell | 175,852 | 2 | 6 |
| Muirhead & Co. | 174,998 | 11 | 2 |
| The Westminster Construction Co., Ltd., Westminster (*recommended*) | 172,630 | 12 | 6 |

The chief engineer's estimate comparable with the tenders is 172,750*l*.

For construction of the Southern low-level sewer No. 2, for the London County Council.

| | | | |
|---|---|---|---|
| Perry & Co. | £531,384 | 0 | 0 |
| Muirhead & Co. | 525,873 | 13 | 2 |
| Westminster Construction Co. | 513,900 | 0 | 0 |
| Whyte & Co. | 513.523 | 13 | 6 |
| Mowlem & Co. | 499,763 | 0 | 0 |
| Neal | 488,197 | 7 | 4 |
| Bentley & Son | 483,612 | 19 | 11 |
| Griffiths & Co., London Wall, E.C. (*recommended*) | 481,553 | 9 | 11 |

For the erection of a secondary school for 456 girls on the Furzedown site, Wandsworth, for the L.C.C.

| | | | |
|---|---|---|---|
| F. & H. F. Higgs | £36,034 | 0 | 0 |
| Downs | 35,723 | 0 | 0 |
| Lovatt | 35,281 | 0 | 0 |
| Smith & Sons | 35,180 | 0 | 0 |
| Leslie & Co. | 34,976 | 0 | 0 |
| Wallis & Sons | 34,769 | 0 | 0 |
| Wall | 34,665 | 9 | 8 |
| Carmichael | 34,236 | 0 | 0 |
| Johnson & Co. | 34,083 | 0 | 0 |
| Spencer, Santo & Co. | 33,884 | 0 | 0 |
| Holliday & Greenwood (*recommended*) | 33,577 | 0 | 0 |
| J. & C. Bowyer | 33,575 | 0 | 0 |
| J. & M. Patrick (*withdrawn*) | 28,700 | 0 | 0 |
| Estimate of the architect (education) | 32,961 | 0 | 0 |

For erecting on the Hoxton House site, Hoxton, (1) an elementary school for 623 children; (2) a higher school for 390 children; (3) a school for 80 physically and 80 mentally defective children, and (4) for a handicraft centre for 40 boys, cookery, and housewifery centres and a schoolkeeper's house, for the London County Council.

| | | | |
|---|---|---|---|
| Todd & Newman | £36,240 | 0 | 0 |
| Garrett & Son | 35,806 | 0 | 0 |
| McCormick & Sons | 33,779 | 0 | 0 |
| Lawrence & Son | 33,433 | 0 | 0 |
| Kirk & Randall | 33,368 | 0 | 0 |
| Treasure & Son | 33,012 | 0 | 0 |
| J. & M. Patrick | 32,990 | 0 | 0 |
| Patman & Fotheringham | 32,741 | 0 | 0 |
| Johnson & Co., Wandsworth Common (*recommended*) | 32,633 | 15 | 11 |

For erection of additional offices for the Royal London Mutual Insurance Society, in Finsbury Square. Mr. JOHN BELCHER, R.A., architect.

| | | | |
|---|---|---|---|
| Wall | £27,307 | 0 | 0 |
| Holland & Hannen | 25,954 | 0 | 0 |
| Foster & Dicksee | 25,605 | 0 | 0 |
| Cubitt | 25,525 | 0 | 0 |
| Trollope & Colls | 24,994 | 0 | 0 |
| Lawrance & Sons | 24,601 | 0 | 0 |
| Higgs & Hill | 24,594 | 0 | 0 |
| Carmichael | 24,569 | 0 | 0 |
| Waring White Building Co. | 24,569 | 0 | 0 |
| Prestige & Co. | 24,554 | 0 | 0 |
| Kerridge & Shaw | 24,473 | 0 | 0 |
| Holloway | 24,368 | 0 | 0 |
| Downs | 24,150 | 0 | 0 |
| H. & H. F. Higgs | 23,933 | 0 | 0 |
| Williams | 23,900 | 0 | 0 |
| Simpson & Sons | 23,881 | 0 | 0 |
| Lawrence & Son | 23,862 | 0 | 0 |
| Holloway Bros. | 23,500 | 0 | 0 |
| Godson & Sons | 23,442 | 0 | 0 |
| Spencer, Santo & Co. | 23,359 | 0 | 0 |

### LONDON—*continued.*

For the construction of the raft foundation and retaining walls in connection with the new L.C.C. county hall.

| | | | |
|---|---|---|---|
| Lawrance & Sons | £65,186 | 0 | 0 |
| Mowlem & Co. | 62,949 | 0 | 0 |
| Higgs & Hill | 61,462 | 0 | 0 |
| Perry & Co. (Bow) | 60,300 | 0 | 0 |
| Carmichael | 59,576 | 0 | 0 |
| Kirk & Randall | 57,891 | 0 | 0 |
| Pearson & Son | 57,544 | 15 | 5 |
| Price & Reeves | 57,255 | 12 | 0 |
| Holloway | 54,788 | 0 | 0 |
| Holloway Bros. (London) | 49,800 | 0 | 0 |
| Wall | 48,900 | 0 | 0 |
| Dick, Kerr & Co. | 48,416 | 2 | 3 |
| F. & H. F. Higgs (*recommended*) | 46,900 | 0 | 0 |

### NAPSBURY.

For additions to Napsbury Asylum, for the Middlesex County Council. Mr. ROWLAND PLUMBE, architect, 13 Fitzroy Square, W.

| | | | |
|---|---|---|---|
| Williams | £71,300 | 0 | 0 |
| Allen & Sons | 70,070 | 0 | 0 |
| Dick, Kerr & Co. | 68,469 | 3 | 6 |
| Higgs & Hill | 68,244 | 0 | 0 |
| Holland & Hannen | 66,750 | 0 | 0 |
| Carmichael | 66,100 | 0 | 0 |
| Wall | 65,000 | 0 | 0 |
| Chessum & Sons | 64,760 | 0 | 0 |
| Greenwood | 64,450 | 0 | 0 |
| Pethick Bros. | 63,266 | 0 | 0 |
| Waring & White | 63,041 | 0 | 0 |
| Mowlem & Co. | 62,913 | 0 | 0 |
| Holloway Bros. | 62,600 | 0 | 0 |
| Perry & Co. | 61,975 | 0 | 0 |
| Pattison & Son | 61,120 | 0 | 0 |
| Minter | 61,000 | 0 | 0 |
| Lovatt | 60,915 | 0 | 0 |
| Spencer, Santo & Co. | 60,760 | 0 | 0 |
| Leslie & Co. | 60,358 | 0 | 0 |
| Foster & Dicksee | 59,859 | 0 | 0 |
| Wallis & Sons | 58,276 | 0 | 0 |
| Johnson & Co. | 57,750 | 0 | 0 |
| Lawrence & Son, Tottenham (*recommended*) | 56,948 | 0 | 0 |

### WALES.

For extensions to the Cardiff Infirmary. Mr. E. M. BRUCE VAUGHAN, F.R.I.B.A., Cardiff.

| | | | |
|---|---|---|---|
| Shepston & Sons | £37,703 | 15 | 0 |
| Britton | 37,604 | 0 | 0 |
| Blake | 36,964 | 0 | 0 |
| Stephens, Bastow & Co. | 36,255 | 0 | 0 |
| Williams | 36,000 | 0 | 0 |
| Cowlin & Son | 35,900 | 0 | 0 |
| Davies & Sons | 35,550 | 0 | 0 |
| Bosworth & Lowe | 35,546 | 0 | 0 |
| Evans Bros. | 34,849 | 0 | 0 |
| Moss & Sons | 34,800 | 0 | 0 |
| Symonds & Sons | 34,754 | 7 | 4 |
| Turner & Sons | 34,660 | 0 | 0 |
| Charles | 34,659 | 0 | 0 |
| Davies & Howell | 34,498 | 0 | 0 |
| Allen | 34,453 | 7 | 10 |
| Knox & Wells | 34,143 | 0 | 0 |
| Thomas & Co. | 33,786 | 0 | 0 |
| Bond | 32,851 | 0 | 0 |

### WOOLWICH.

For the construction of a tunnel for foot passengers under the Thames between North and South Woolwich for the London County Council.

| | | | |
|---|---|---|---|
| Perry & Co. | £122,527 | 0 | 0 |
| Pearson & Son | 104,856 | 14 | 8 |
| Griffiths & Co. | 96,542 | 1 | 0 |
| Muirhead & Co. | 92,743 | 10 | 6 |
| Price & Reeves | 92,600 | 0 | 0 |
| Cochrane & Sons | 91,032 | 2 | 1 |
| Whyte & Co. | 85,135 | 19 | 6 |
| Mowlem & Co. | 80,506 | 0 | 0 |
| Scott & Middleton, 28 Victoria Street, S.W. (*recommended*) | 78,860 | 7 | 1 |

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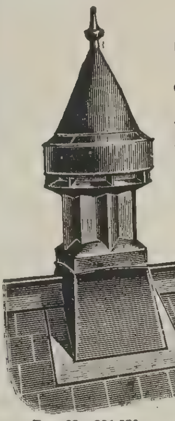

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## R.I.B.A. PASS LIST.

### THE NOVEMBER EXAMINATIONS.

### *The Preliminary.*

THE preliminary examination, qualifying for registration as Probationer R.I.B.A., was held in London and the undermentioned provincial centres on November 8 and 9. Of the 123 candidates admitted, claims for exemption from sitting for the examination were allowed to the number of thirty-five. The remaining eighty-eight candidates were examined, with the following results:—

| District. | Number Examined. | Passed. | Relegated. |
|---|---|---|---|
| London | 46 | 26 | 20 |
| Birmingham | 4 | 3 | 1 |
| Bristol | 7 | 5 | 2 |
| Cardiff | 3 | 2 | 1 |
| Glasgow | 3 | 2 | 1 |
| Leeds | 6 | 5 | 1 |
| Manchester | 16 | 8 | 8 |
| Newcastle | 3 | 3 | 0 |
| | 88 | 54 | 34 |

The eighty-nine passed and exempted candidates, who have been registered as Probationers, are as follows:—Samuel William Ackroyd, Walter Alwyn Cole Adams, Walter Alison, Samuel Norman Anglin, Eric Langton Apperly, John Llewellyn Arthur, John Sidney Ashbolt, Philip Hope Edward Bagenal, Charles Bell, Albert William Betts, Sohrab Keikhosru Bhedvar, Charles Kydd Blyth, Frederick Eckersley Boddington, Frank Arthur Broadhead, Percy Norman Brown, Robert Stanley Cobb, Charles Reginald Cook, Harold William Court, Enos James Crabtree, Harry Ewart Crossland, John Spedding Curwen, Thomas Daly, Frank Twydale Dear, Harold Alfred Dod, Benjamin Donaldson, William James Donger, Hywel Carey Edmunds, Sidney James Edwards, Reginald Percy Farr, Donald Fletcher, Walter Ernest Fox, William Hubert Godwin, Stacey Gratton, Hubert Gregory, Thomas Cressey Hamilton, Stanley William Harman, Gordon Hemm, Ernest James Hickman, Harry Armitage Hickson, Frank Holroyd, Alfred William Horton, Sydney Hoten, Arthur Hunter, John Alfred Barnes James, Rees Jones, Walter John Knight, Clifford Herbert Le Grice, Hugh Lennox, Glyndwr Morrison Lewis, Sidney George Lipscomb, Horace Edgar Litten, Duncan St. Clair MacPhail, John Ewart March, Dario Marcucci, Joseph Moore, Raisley Stewart Moorsom, Cyril Savage Morley, William Noel Jobson Moscrop, Walter Norris, Thomas John Orme, Edgar Mainwaring Parkes, Abdulla Bhanji Peermahomed, George Wallace Proffitt, Stantislaus Roarty, Graham John Robinson, Walter Rogers, Andrew Laurence Noel Russell, John Seymour Sawer, Thomas Edwin Thornton Shanks, Cecil George Simmons, Arthur Smith, Thomas Retford Somerford, Thomas Tearle Stevens, John Alexander Chisholm Taylor, William Richard Templar, Cedric Maurice Teulon, George Thomas, William Norman Thomas, Harris Stephens Triscott, Harold Frederick Walker, Henry Welch, Archibald John West, Frederick Ernest Williams, John Gerrard Williams, Henry Roehead Williamson, Kenneth Mark Winch, Ronald Winter, Norman Frederic Woodroffe, Charles Edmond Worthington.

### *The Intermediate Examination.*

The Intermediate Examination, qualifying for registration as Student R.I.B.A., was held in London and at the undermentioned provincial centres on November 8, 9, 11, and 12. One hundred and eight candidates were examined, and the results are reported as follows:—

| District. | Number Examined. | Passed. | Relegated. |
|---|---|---|---|
| London | 69 | 35 | 34 |
| Bristol | 5 | 2 | 3 |
| Cardiff | 4 | 2 | 2 |
| Glasgow | 3 | 2 | 1 |
| Leeds | 10 | 4 | 6 |
| Manchester | 11 | 5 | 6 |
| Newcastle | 6 | 1 | 5 |
| | 108 | 51 | 57 |

The names of the successful candidates are as follows, in order of merit, as placed by the Board of Examiners:—

Frank Wardel Knight, William Arthur Rutter, Edward Ralph Douglas Selway, Bernard Wardlaw Habershon Scott, Harry Dawber Holland, Harold Layton Robinson, Kenneth Stephen Broad, David James Moir, Harry Duncan Hendry, James Grey West, William Wylie Houston, William Brighten Rise Morley, William Voelkel, William Henry Gunton, Ernest William Pedley, Horace Vincent De Courcey Hague, Alec Lowe Macmillan, John Seymour Knyvett, Reginald Shears, Stanley Russell Miller, Albert Henry Owen, Arthur John Knott, Frederick Bayliss Nightingale, Harry Bradley, Walter Llewellyn Clark, Henry Colbeck, Robert Stephen Cowper, Joseph Charles Gladstone Davies, Charles Glynn Evans, Richard William Furniss, Stephen Langton Clowes Gilks, Montagu Ashley Hall, George Farncombe Hallett, Samuel Harrison, Bernard Jessop, Arthur Bedford Knapp-Fisher, Cecil Howard Lay, Robert Lowry, Cyril Frederick Martin, Theodore Nelson Newham, Travers Pickmere, Claud Boileau Reid, Arthur Rylatt, Charles Alfred Smeed, Merwanjee Framjee Surveyor, Arthur Edwin Vey, Richard Walker, Herbert Archibald Welch, Thomas Gustavus Whitehead, John Wilks, Frederick Charles Wylde.

### *Exemptions from the Intermediate Examination.*

The following candidates, who had attended the architectural courses and obtained first-class certificates at the schools of architecture of the institutions mentioned against their names, were granted exemption from sitting for the Intermediate Examination, and have been registered as Students R.I.B.A.:—

Robert William Cable (*P.* 1905), (Architectural Association); George Flint Clarkson (*P.* 1905), (Architectural Association); Harold Alfred Dod (*P.* 1909), (Liverpool University); Cyril Arthur Farey (*P.* 1906), (Architectural Association); Alan Vincent Sutherland Graeme (*P.* 1906), (Architectural Association); Guy Donne Gordon Hake (*P.* 1904), (Architectural Association); Leonard Keir Hett (*P.* 1904), (Architectural Association); Geoffrey Wyville Home (*P.* 1905), (Architectural Association); Thomas Anthony Jones (*P.* 1908), (University College, London); Arthur Louis Levy (*P.* 1905), (Architectural Association); Thomas Arthur Lodge (*P.* 1906), (Architectural Association); Bernard Frank Matthews (*P.* 1905), (Architectural Association); Richard Mountford Pigott (*P.* 1905), (Architectural Association); Charles Edward Fellowes Prynne (*P.* 1905), (Architectural Association); Alfred Douglas Robinson (*P.* 1907), (Architectural Association); Francis Harold Swindells (*P.* 1905), (Architectural Association); Edwin John Tanner (*P.* 1906), (Architectural Association); Charles Voysey (*P.* 1906), (Architectural Association).

### *Final and Special.*

The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., were held in London from November 18 to 26. Of the 114 candidates examined, forty-three passed, and seventy-one were relegated to their studies. The names of the passed candidates are as follows:—

John Cooper Ainsworth, George Luard Alexander, John Gordon Allen, Robert Atkinson, Josiah Auty, Quentin Mangnall Bluhm, Arthur Francis Bryan, George Herbert Burstow, Richard Thwaite Chapman, Edward Ernest Blunt Claypole, John Adam Davidson, Claude William Davis, Harry Alderman Dickman, Alexander Houston Douglas, Percie Ion Elton, Edwin Finn, William Goodchild, Leonard Rome Guthrie, Noel Waugh Hadwen, Charles Ernest Hanscomb, Robert Edwin Hastewell, Frederick George Hawkins, Francis Henry Hepple, Henry Clifford Hollis, William Charles Maxwell, William Milburn, jun., Arthur Hamilton Moberly, Joseph Fearis Munnings, Robert Wright Orme, Francis Osler, James Page, David John Roberts, William John Roberts, M.A., George Henry Rowledge, William Henry Sagar, Hugh Henry Scott-Willey, George Marrison Stone, Charles Stonehouse, Morris Thompson, Francis Gordon Troup, Vivian Ware, John Woollatt, Cecil Laurence Wright.

The following table shows the number of failures among the seventy-one relegated candidates in each division of the Final Examination.

| | | |
|---|---|---|
| I. | Design | 51 |
| II. | Mouldings and Ornaments | 61 |
| III. | Building Materials | 15 |
| IV. | Principles of Hygiene | 20 |
| V. | Specifications | 27 |
| VI. | Construction, Foundations, &c. | 33 |
| VII. | Construction, Iron and Steel, &c. | 22 |

### *Colonial Examinations.*

The following candidates passed the Colonial Intermediate Examination held in Sydney, November 1908:—

Royston John Keith-Harris, Stanislaus Roarty.

The following candidates passed the Colonial Special Examinations qualifying for candidature as Associate R.I.B.A. held in Sydney last June:—

Hartley Sutcliffe, Edward Alexander Taylor.

The following candidate passed the Special Examination held in Johannesburg in July last:—

Walter John Beall.

## CALENDARS, DIARIES, &c. FOR 1910.

Messrs. Merryweather & Sons, Ltd., as makers of fire appliances for all over the world, are entitled to have the mount of their hanging calendar in a striking "fire" red. Interleaved with the months are illustrations of a few of their apparatus, including a steam motor cesspool exhauster, an electric motor and Hatfield pump, turn-table fire escapes, &c. Messrs. Spottiswoode & Co., Ltd., printers, mean their calendar to be strictly for use rather than for ornament, or, to look at the matter from another light, the space is used solely for showing the dates in big numerals. A brightly coloured sketch of a local Indian railway station serves as a heading for that of Messrs. Peckett & Sons, the Atlas Locomotive Works, Bristol. A calendar setting forth the virtues of "Duresco" ought to be artistic, and this has been realised by Messrs. James Duthie & Co., Glasgow, agents for Scotland, who have produced a very dainty setting to the months of the year. The obvious advantage of a block calendar is that the numerals can be made sufficiently big to be seen at a distance; in that of Messrs. Ashwell & Nesbit, Ltd., for example, the numerals are seven inches high. There is also room for a Shakespearean quotation for every day in the year.

The twenty-eighth annual issue of the "Sanitary Record Year-book and Diary" is full of useful information for medical officers, sanitary engineers, and others. It includes, amongst other things, a short digest of the sanitary legislation of 1909, the Government departments with their officers, a very complete explanatory list of the numerous societies connected with sanitary matters, and useful memoranda for sanitary engineers and surveyors. The bulk of the book is devoted to the diary, interleaved with blotting-paper, and which gives reminders of local government duties.

"The Practical Electrician's Pocket-book and Diary" (London: S. Rentell & Co., Ltd., 1*s.*) is, of course, more pocket-book than diary, in as far as 350 pages are occupied with a closely printed epitome of the subject, while the diary portion is dismissed in fifty-two. But it is for the former that the book has won so much popularity among its subscribers. As usual, the wonderfully diverse contents have been subjected to careful revision by specialists in each particular branch. Among the sections which have received drastic treatment are those dealing with gas, oil and petrol engines, polyphase machinery, osram and tantalum lamps, time switches, &c., whilst additional matter treats of the Siemens O.S. wiring system, auto-transformers, instructions to chargemen, and other subjects.

Messrs. Hudson & Kearns, Ltd., have forwarded to us four of their valuable diaries. No. 9, the smallest, is for universal use; it deals, however, with such special subjects as land registration, London building regulations, law cases, lists of district surveyors and professional bodies, stamp duties, and much else. No. 11 is "The Builder's Diary," and has, in addition to all the above, a rent, insurance and mortgage register, a cash book, a hundred pages of tables, as well as a wages table and a weekly wages table on the fifty-four hours' scale. Nos. 12 and 13 are "The Architect's Diary"—an invaluable adjunct to the professional man. In No. 13, which is the larger of the two, two pages are devoted to each day; one is devoted to the record of appointments made and business transacted, the other to cash items, so that all the entries made on one day face one another. It is followed by a summary of cash transactions, a few pages for notes, register, and twenty-five ledger pages. All the above is in addition to information of special use to architects. Both of the diaries may be obtained fitted with a lock and key.

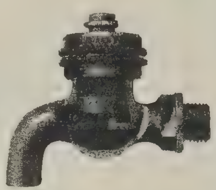
## TRADE NOTES.

Messrs. Arthur L. Gibson & Co. are now well-established at their new factory by the riverside at Strawberry Vale, Twickenham, of which a descriptive account will shortly appear in these pages. To cope with their steadily growing business and for purposes of greater convenience the firm have removed their offices and warehouses also from Tower Street, W.C., to the new Radnor Works at Twickenham, to which they desire that all communications be now sent.

At the annual meeting of the British Uralite Company the Chairman announced that the sales of the company's materials had increased by 21 per cent. during the period July 1 to December 31, 1909.

The extract from the camphor tree is universally known for its medicinal qualities. The tree is now put to other uses as well, for the wood is really a most excellent material for flooring boards and blocks. Of how many varieties of timber now imported can it be said that lengths up to 30 feet are free from knots? But this is true of camphor wood. Possessing the qualities of teak without its expense, this wood is also a germicide, and therefore peculiarly fitted for hospital work. It is also free from that bugbear dry rot. A fine sample has come to us from the China Borneo Company, Ltd., 5 Whittington Avenue, E.C., who state that they have a large assortment of sizes in stock for immediate delivery.

Among the "novelties" of the last Building Trades Exhibition was the tap exhibited by Garratt's Patent Screwdown Valve Company. This patent, as may be remembered, replaced the usual screwed spindle and jumper, with its troublesome washers, by a piston which is raised or lowered in turning the strong coarse screw of the cap. The chances of the tap getting out of order are so minimised as to become almost negligible. In the past few months the company have received many testimonials. A typical one came two or three weeks ago from a civil engineer who fitted twenty-three in his house, and who says after six months' use "they are all giving complete satisfaction. I have them fitted to both hot and cold taps, to all my sinks, both my baths, all my lavatory basins." As "seeing is believing," the Garratt's Patent Screwdown Valve Company are willing to send a sample tap free of charge to any architect, engineer, or builder who applies to their city offices at 11 Queen Victoria Street, London, E.C.



An important book for builders, contractors, and manufacturers is Oxborrow's Combined Order, Prime Cost, Charges to Customer and Summary Book. The system employed is easy to keep, absolutely reliable, and is invaluable to all firms whose business may consist largely of repairs and jobbing work. Many a good paying business has been ruined by the overlooking of small items in charging up items which may turn a job from loss to profit; by the use of this system this is impossible. The cost of the work is only 5*s.* 6*d.*, and may be obtained from Cockayne & Co., Ltd., 185 Walworth Road, London, S.E.

When a firm like Messrs. Chubb & Sons see fit to put a new patent upon the market it may be safely inferred that the novelty is worth serious examination. Their latest lock is called the "Disc" lock, and it is of the springless class. The makers say that the form of construction being simple it allows of the rapid production of the parts by their expensive plant at Wolverhampton, so that the locks are offered at low prices. As the mechanism of the locks consists of nothing more than a number of independent and differently cut discs, an infinite number of variations is obtainable. The "Disc" lock is sold as affording exceptional security, and no greater guarantee can be given by Messrs. Chubb & Sons' Lock and Safe Company, Ltd.

## VARIETIES.

The pier at St. Leonards is to be lengthened at a cost of 17,000*l.*, to facilitate the steamer traffic.

About forty-eight workmen's houses, a large model lodging-house, and two restaurants are to be built at Kinlochleven for the use of the British Aluminium Company. The contractors are Messrs. M'Lauchlin & Harvey, Belfast, who built most of the new town of Kinlochleven.

A technical institute is to be provided at Ponders End, N., at an estimated cost of 6,600*l.* The Middlesex County Council will contribute 4,400*l.*, the Enfield District Council 1,700*l.*, and the War Office 500*l.*

The Court of Arbitration appointed by the Board of Trade to consider the differences between the Glasgow Master Plasterers' Association and the Glasgow District of the Scottish National Operative Plasterers' Federal Union met last week in the Building Trades Exchange, 67 Hope Street, Glasgow. The matters in dispute were a demand by the employers for a reduction in wages of ½*d.* per hour, and a demand by the operatives for a limitation of apprentices. After hearing evidence on the wages question, the Court decided that the employers had failed to prove their case, and the operatives, without prejudice, withdrew their demand for limitation.

A work of considerable importance to all interested in naval history, entitled "Naval Wars in the Baltic," will shortly be issued by Mr. C. Gilbert-Wood, the naval and military publisher of Arundel Street, W.C. It will deal very fully with the history of the navies of all the Baltic Powers during the period of the sailing ship. The author is Mr. R. C. Anderson, M.A., F.R.G.S., an officer of the Naval Volunteers. A great feature of the work is the thoroughness and completeness of the indices and the series of appendices of ships lost in action.

THE

# Architect and Contract Reporter.

FRIDAY, JANUARY 14, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

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## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

IRELAND.—Jan. 31.—The Pembroke Urban District Council, Co. Dublin, invite schemes and estimates for laying out Herbert Park (35 acres). Mr. J. C. Manly, Clerk, Town Hall, Pembroke, Co. Dublin.

KEIGHLEY.—Jan. 15.—The education committee invite local architects to submit designs and estimates by above date for an elementary school at Highfield. Mr. H. Midgley, Secretary, Education Offices, Keighley.

LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l.* and 5*l.* Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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## CONTRACTS OPEN.

Allostock.—Jan. 26.—For alterations and additions to present buildings at the County Council school. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Belfast.—Jan. 25.—For erection of proposed abattoir in Stewart Street. Deposit 5*l.* 5*s.* The City Surveyor, City Hall, Belfast.

Bristol.—Jan. 26.—For erection of ten cottages at Avonmouth, for the watch committee. Deposit 1*l.* 1*s.* Mr. Peter Addie, city valuer, The Exchange, Bristol.

Buttermere.—Jan. 22.—For alterations and additions to Buttermere Hotel, near Cockermouth. Mr. Thomas B. Simmons, surveyor, Council Offices, Cockermouth.

Chelmsford.—Jan. 17.—For erection of an elementary school at Trinity Road, Springfield. Deposit 2*l.* Messrs. Chas. & W. H. Pertwee, architects, Chelmsford.

Cleckheaton.—Jan. 25.—For the erection of a partition at Westgate Provided Infants' School, Cleckheaton. The West Riding County Council Education Offices, Heckmondwike.

Coventry.—Jan. 19.—For the work of enlarging the Radford Council School. Messrs. G. & I. Steane, architects, 22 Little Park Street, Coventry.

Dorchester.—Jan. 21.—For carrying out repairs, alterations and additions at Stratton Manor, High West Street, Dorchester, in order to adapt the premises as county offices. The County Surveyor's Office, Shire Hall, Dorchester.

Enfield.—Jan. 17.—For construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, for the Metropolitan Water Board. The Chief Engineer, Savoy Court, W.C. Deposit 10*l.* with the Accountant at Savoy Court, Strand, W.C.

Exeter.—Jan. 18.—For alterations and additions to No. 1 Higher Summerlands. Deposit 1*l.* 1*s.* Mr. R. M. Challice, surveyor to the Guardians, 14 Bedford Circus, Exeter.

Exmouth.—Jan. 24.—For carrying out alterations at the Foresters' Arms, Chapel Street. Mr. P. Kerley, architect and surveyor, National Provincial Bank Chambers, Exmouth.

Erpingham.—Jan. 15.—For the following works at Overstrand, Norfolk, viz., the construction of a new road, sea wall, and gangway approach to the beach. The Post Office, Overstrand, near Cromer.

Flixton.—Jan. 17.—For erection of an elementary school at Flixton, near Manchester, to accommodate 370 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Gillingham.—Jan. 24.—For making the necessary foundations, &c., for one 200 horse-power Diesel oil-engine and alternator, at the generating station, Gillingham Road. The Borough Electrical Engineer, the Generating Station, Gillingham Road.

Guildford.—Jan. 28.—For supply of all material for and the erection of nine arches, one main flue, and one chimney at the gasworks, Onslow Street. Deposit 1*l.* 1*s.* Mr. P. C. Cleasby, Gasworks, Guildford.

Halifax.—Jan. 24.—For the various works required in erection of workshop at Highroad Well. Messrs. Jackson & Fox, architects, Rawson Street, Halifax.

Halifax.—Jan. 26.—For the reinstating of Kingston Confectionery Works. Messrs. Medley Hall & Sons, architects and surveyors, 1 Harrison Road, Halifax.

Honley.—For the several works required in erection of a Congregational church, with spire, at Honley, Huddersfield. Messrs. W. J. Morley & Sons, architects, 269 Swan Arcade, Bradford.

Hornchurch.—Jan. 19.—For structural alterations to the school at their Cottage Homes, Hornchurch, near Romford, Essex, for the Guardians of St. Leonard, Shoreditch. Mr. F. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria Street, S.W.

Leeds.—Jan. 27.—For the erection of a urinal in Meanwood Road. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Liverpool.—Jan. 26.—For the construction of a public washhouse at Netherfield Road North, and also for the engineering work required therein. Deposit 1*l.* 1*s.* Mr. W. R. Court, engineer and chief superintendent, Municipal Offices, Liverpool.

London.—Jan. 25.—For erection of a coroner's court at High Street, Poplar, E., for the London County Council. Deposit 2*l.*, with the cashier of the Council, at the County Hall, Spring Gardens, S.W. The Superintendent Architect's Department, General Section, 19 Charing Cross Road, W.C.

Macclesfield.—Jan. 18.—For the erection of a detached villa for private patients at Parkside Asylum. Deposit 2*l.* Mr. H. Beswick, county architect, Chester.

Malton.—Jan. 20.—For the completion of the nave, &c., of Norton Church, Malton, Yorks. Mr. W. Morton, quantity surveyor, 45 John Street, Sunderland.

Natland.—Jan. 22.—Tenders are invited, either in whole or separate trade contracts, for erection of proposed residence, Natland, Kendal. Mr. John F. Curwen, F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Northwich.—Jan. 15.—For erection of school to accommodate 350 children, at Northwich Darwin Street. Deposit 1*l.* 1*s.* Apply after December 28 at the Education Office, Verdin Technical school, Northwich.

Okehampton.—Jan. 17.—For new higher elementary school for 120 children, with laboratory, cooking, and manual training rooms, at Okehampton, Devon. Deposit 1*l.* 1*s.* The County Architect (education), 1 Richmond Road, Exeter.

Oakengates.—Jan. 21.—For erection of an infants' Council school at Harts Hill, Wombridge, Oakengates, Salop. Deposit 2*l.* 2*s.* Messrs. Dickens-Lewis & Haymes, architects, Talbot Chambers, Shrewsbury.

Oldham.—Jan. 19.—For the reconstruction of roof over gentlemen's swimming baths at Central Baths. The Borough Surveyor's Office, Oldham.

Pettaugh.—Feb. 7.—For erection of a new school for about 60 children at Pettaugh, near Stowmarket. Deposit 1*l.* 1*s.* Send names to Mr. W. E. Watkins, secretary, Education Office, County Hall, Ipswich.

Portsmouth.—Jan. 25.—For additions to the boys' secondary school, Victoria Road North, Southsea. Mr. A. H. Bone, architect and surveyor, Cambridge Junction, Portsmouth.

Spennymoor.—Jan. 18.—For the erection of a higher elementary school. Mr. W. Rushworth, Shire Hall, Durham.

Spurstow.—Jan. 26.—For alterations and additions to the school buildings, Spurstow, near Tarporley, Cheshire. Deposit 1*l.* Mr. H. Beswick, county architect, Newgate Street, Chester.

Talkin.—Jan. 17.—For repairs to school and house, for the managers of Talkin school. Mr. R. Routledge, Talkin, near Carlisle.

Wakefield.—Jan. 21.—For alterations and additions, builder, joiner, slater, plumber, plasterer, painter, asphalter, heating engineer, at Oxenhope Horkinstone Provided school. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

Wales.—Jan. 15.—For works of improvement and alterations to the Hafod Council school and out-offices, and for proposed new water-supply. Deposit 1*l.* 1*s.* The County Education Offices, Newtown, Montgomery.

Wales.—Jan. 17.—For erection of a cottage hospital at Pontypridd. Deposit 2*l.* 2*s.* Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

Wales.—Jan. 19.—For erection of twelve cottages for the Llancaiach Building Club, on Caerphilly Road, Nelson, Glam. Mr. Idris Leyshon, architect and surveyor, 7 Hanbury Road, Bargoed.

Wales.—Jan. 20.—For the extension of Bethany English Baptist Chapel, Treherbert, Rhondda Valley. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

Wales.—Jan. 21.—For erection and completion of three houses at Pentre. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

Wales.—Jan. 22.—For erection of nine houses on the Gilfach Maen Estate, Trelewis, for the Gilfach Maen Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—Jan. 24.—For erection of two shops and premises at Blackwood, Mon. Mr. D. J. Thomas, architect, High Street, Blackwood, Mon.

Wales.—Jan. 24.—For alterations and additions to premises in Morgan Street, Pontypridd. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

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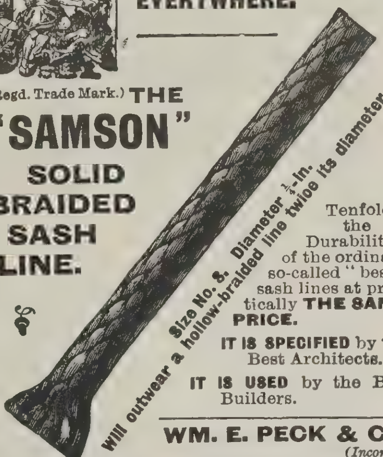
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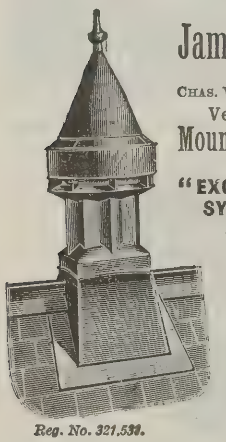

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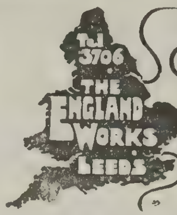

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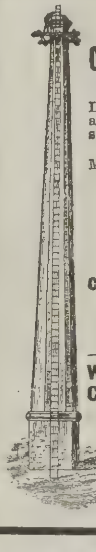

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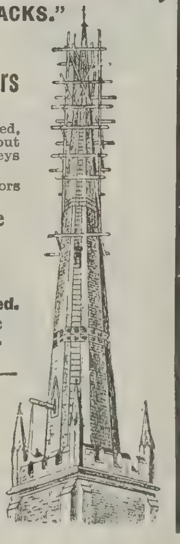

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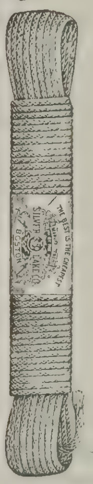

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# HANDSOME CLOTH CASES for binding "Th Architect," price 2/- each.

Wales.—Jan. 25.—For building a masonic temple for the Loyal Cambrian Lodge of Freemasons, No. 110, at Merthyr Tydfil. Mr. C. R. Davies, architect, 112 High Street, Merthyr.

Wales.—Jan. 26.—For the extension of the Queen Street infants' school, Abertillery. Deposit 1*l.* 1*s.* Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

Wales.—Jan. 29.—For erection of premises at Treherbert, for the Conservative Club. Deposit 2*l.* 2*s.* Mr. J. Rees, architect, Pentre.

Woolwich.—Jan. 19.—The Council of the Metropolitan Borough of Woolwich invite tenders for painting and repairs at the Public Library, High Street, Eltham. Mr. J. Rush Dixon, M.I.C.E., borough engineer, Town Hall, Woolwich.

West Bromwich.—Jan. 21.—For the erection at the Union workhouse of galvanised iron buildings, &c. Mr. John W. Allen, architect, 298 High Street, West Bromwich.

Yarm.—Feb. 2.—For alterations and improvements at the Yarm Council School, for the North Riding of Yorkshire County Council. Apply to the master or caretaker, Council School, Yarm, Yorks.

## TENDERS.

### ASHBY-DE-LA-ZOUCH.

For erecting new elementary school, &c., for the education committee. Mr. J. Day, architect, 8 New Street, Leicester.

| | | | |
|---|---|---|---|
| Garlick | £4,669 | 17 | 6 |
| Hodges | 4,648 | 0 | 0 |
| Moss & Son | 4,545 | 0 | 0 |
| Griffin Bros. | 4,500 | 0 | 0 |
| Fox | 4,497 | 0 | 0 |
| Barker & Sons | 4,489 | 0 | 0 |
| Potter | 4,488 | 15 | 0 |
| Bradshaw Bros. | 4,486 | 0 | 0 |
| Cole & Sons | 4,404 | 19 | 0 |
| Sleath | 4,385 | 0 | 0 |
| Stanger | 4,384 | 0 | 0 |
| Orton & Son | 4,379 | 17 | 11 |
| Bradford | 4,324 | 0 | 0 |
| Chapman | 4,290 | 0 | 0 |

### BRISTOL.

For extension of casual wards at Eastville workhouse.

| | | | |
|---|---|---|---|
| Lovell, Bristol (*accepted*) | £1,759 | 0 | 0 |

### CASTLE DONINGTON.

For erecting a Council school, for the education committee.

| | | | |
|---|---|---|---|
| Griffin Bros. | £5,265 | 12 | 0 |
| Harding | 5,210 | 0 | 0 |
| Faulks | 5,147 | 0 | 0 |
| Fox | 5,130 | 0 | 0 |
| Cole & Sons | 5,108 | 0 | 0 |
| Barker & Sons | 5,050 | 0 | 0 |
| Corah & Son | 4,995 | 0 | 0 |
| Wileman | 4,975 | 0 | 0 |
| Bradshaw Bros. | 4,953 | 0 | 0 |
| Chapman | 4,910 | 0 | 0 |
| Garlick | 4,836 | 19 | 0 |
| Perks & Son | 4,814 | 0 | 0 |
| Moss & Sons | 4,700 | 0 | 0 |
| Barlow & Co. | 4,628 | 0 | 0 |
| Brown & Son | 4,624 | 0 | 0 |
| Sleath, Rothley (*accepted*) | 4,622 | 15 | 0 |

### DUNDEE.

For supply of 172 tons or thereabouts of 15-inch cast-iron pipes for the Water Commissioners. Mr. George Baxter, engineer.

| | | | |
|---|---|---|---|
| Holwell Iron Co. | £1,061 | 8 | 9 |
| Stanton Ironworks Co. | 1,054 | 5 | 4 |
| Oakes & Co. | 1,039 | 18 | 6 |
| Clay Cross Co. | 1,032 | 15 | 0 |
| Staveley Coal and Iron Co. | 1,018 | 8 | 2 |
| Cochrane & Co. | 1,011 | 4 | 8 |
| Laidlaw & Sons | 1,006 | 18 | 8 |
| Stewart & Co. | 989 | 14 | 4 |
| Macfarlane, Strang & Co. | 989 | 14 | 4 |
| Maclaren & Co., Eglinton Foundry (*accepted*) | 947 | 13 | 2 |

### ENDERBY (LEICS.).

For laying water mains from the Narborough cross-roads to the village of Enderby, together with valves, hydrants, and other works in connection therewith, for the Blaby Rural District Council.

| | | | |
|---|---|---|---|
| Dix & Co. | £2,187 | 3 | 10 |
| Clark | 2,160 | 0 | 0 |
| Screaton | 2,090 | 0 | 0 |
| Wright & Co. | 2,049 | 3 | 1 |
| Turner | 2,030 | 14 | 4 |
| Acme Flooring and Paving Co. (1904) | 2,026 | 8 | 0 |
| Preston | 1,987 | 15 | 10 |
| Buckley | 1,960 | 15 | 10 |
| Stimpson & Rolleston | 1,953 | 8 | 4 |
| Hill | 1,857 | 6 | 9 |
| Ball | 1,830 | 10 | 0 |
| Wickstead & Co. | 1,814 | 6 | 0 |
| Chamberlain, Leicester (*accepted*) | 1,805 | 5 | 8 |
| Bateman | 1,676 | 1 | 10 |
| Palmer | 1,669 | 0 | 0 |
| Brebner & Co. | 1,630 | 15 | 10 |
| Macdonald | 1,590 | 0 | 0 |

### KIRKBY-IN-ASHFIELD.

For the erection of public offices.

| | | | |
|---|---|---|---|
| Coleman & Blackburn, Kirkby (*accepted*) | £1,490 | 0 | 0 |

### LONDON.

For certain new water-closets and slop sinks and fixing, at the Chase Farm Schools, Enfield, N. Mr. Stuart Hill, architect, 106 Cannon Street, E.C.

| | | | |
|---|---|---|---|
| Thomas | £374 | 0 | 0 |
| Pavey & Son | 327 | 0 | 0 |
| Brown | 299 | 7 | 0 |
| Fitch & Cox | 294 | 0 | 0 |
| Porter | 251 | 0 | 0 |
| Watkin & Son | 233 | 12 | 0 |
| Monk (*accepted*) | 195 | 0 | 0 |

### MARYPORT.

For works of water supply. Mr. J. Campbell Boyd, C.E., engineer, Carlisle.

| | | | |
|---|---|---|---|
| Bushby & Sons, Leeds (*accepted*) | £10,586 | 0 | 0 |

### MELKSHAM.

For erection of sanitary blocks at Lowbourne Council schools, Melksham, Wilts.

| | | | |
|---|---|---|---|
| Price | £550 | 0 | 0 |
| Isley & Co. | 497 | 7 | 0 |
| Parsons Bros. | 495 | 0 | 0 |
| Bigwood & Co. | 488 | 3 | 9 |
| Leazey | 450 | 0 | 0 |
| Blackford & Son | 440 | 0 | 0 |
| Ash | 436 | 0 | 0 |
| Davies & Sons | 429 | 0 | 0 |
| Chivers & Sons | 427 | 3 | 5 |
| Moore & Sons | 410 | 10 | 6 |
| Button, Trowbridge (*accepted*) | 408 | 0 | 0 |

### OXFORD.

For erection of South Oxford schools, St. Aldate's and St. Ebbe's. Mr. William H. Castle, city estate surveyor, Oxford.

| | | | |
|---|---|---|---|
| Brucker Bros. | £12,667 | 0 | 0 |
| Tombs & Son | 12,569 | 0 | 0 |
| Sureig | 11,600 | 0 | 0 |
| Simms & Son | 10,610 | 0 | 0 |
| Kimberley | 10,600 | 0 | 0 |
| Beardsmore & West | 10,525 | 0 | 0 |
| Higgs | 10,415 | 0 | 0 |
| Stephens, Bastow & Co. | 10,394 | 0 | 0 |
| Parnell & Son | 10,360 | 0 | 0 |
| Colebourne | 10,289 | 0 | 0 |
| Webster | 10,210 | 0 | 0 |
| Kingerlee & Sons | 9,987 | 0 | 0 |
| Benfield & Loxley | 9,937 | 0 | 0 |
| Pethick Bros. | 9,910 | 0 | 0 |
| Wooldridge & Simpson | 9,897 | 0 | 0 |
| Flint, High Wycombe (*accepted*) | 9,487 | 0 | 0 |

### WEMBLEY.

For alterations at No. 1 The Parade, for Mr. Wm. Mallinson. Messrs. George Baines & Son, architects, 5 Clement's Inn, W.C.

| | | | |
|---|---|---|---|
| Tribe & Co. | £394 | 0 | 0 |
| J. & W. Pink | 363 | 5 | 0 |
| Batley, Sons & Holness (*accepted*) | 340 | 10 | 0 |

### PORTSMOUTH.

For pulling down existing offices and erecting new ones in the girls' and infants' playground at Stamshaw Council School. Mr. A. H. Bone, surveyor, Portsmouth.

| | | | |
|---|---|---|---|
| Barnes | £1,199 | 0 | 0 |
| Light | 1,151 | 10 | 0 |
| Salter | 1,118 | 0 | 0 |
| Tanner | 1,100 | 0 | 0 |
| Gumbleton | 1,078 | 1 | 5 |
| Bayly | 1,074 | 11 | 10 |
| Pryer & Sons | 1,065 | 15 | 9 |
| Crockerell | 1,029 | 0 | 0 |
| Privett | 967 | 0 | 0 |
| Jones & Son, Portsmouth (*accepted*) | 943 | 0 | 0 |
| Buckett | 930 | 0 | 0 |

### WALES.

For the extension of Council chamber and the erection of a new wing at the Council offices, Hengoed, for the Gellygaer Urban District Council. Mr. J. P. Jones, surveyor, Hengoed, via Cardiff.

| | | | |
|---|---|---|---|
| D. Davies & Sons | £1,544 | 0 | 0 |
| W. & D. Thomas | 1,519 | 12 | 4 |
| Davis | 1,408 | 14 | 7 |
| Colborne | 1,398 | 10 | 0 |
| Evans | 1,342 | 13 | 4 |
| Howells | 1,340 | 0 | 0 |
| Hamilton & Millard | 1,323 | 0 | 0 |
| D. W. Davies & Co. (Howell) | 1,295 | 0 | 0 |
| Forsyth | 1,279 | 9 | 6 |
| Vodden & Lee, Bargoed (*accepted*) | 1,154 | 17 | 0 |

For the construction of an occupation road, about 488 yards in length, on the site for small holdings at Capel Llanilltern, near Creigiau, for the Cardiff Corporation. Mr. W. Harpur, M.I.C.E., city engineer.

| | | | |
|---|---|---|---|
| Davies | £757 | 0 | 0 |
| Thomas | 743 | 11 | 7 |
| Matthews | 688 | 8 | 7 |
| Collins & Co. | 590 | 5 | 7 |
| Hames | 561 | 0 | 6 |
| Osmond & Sons | 533 | 2 | 11 |
| Barnes, Chaplin & Co. | 522 | 1 | 7 |
| Ringham | 504 | 11 | 1 |
| Rutter, Cardiff (*accepted*) | 497 | 3 | 2 |

### WALGRAVE.

For a Council school, for Northamptonshire education committee. Messrs. Law & Harris, architects, Northampton.

| | | | |
|---|---|---|---|
| Goodman & Murkett | £2,596 | 0 | 0 |
| Heap | 2,569 | 0 | 0 |
| Andrew | 2,540 | 0 | 0 |
| Higgs | 2,487 | 0 | 0 |
| Marriott | 2,480 | 0 | 0 |
| Martin | 2,480 | 0 | 0 |
| Green | 2,459 | 0 | 0 |
| Heath | 2,396 | 0 | 0 |
| Beardsmore & West | 2,379 | 0 | 0 |
| Hawtin | 2,379 | 0 | 0 |
| Sharman & Son | 2,345 | 0 | 0 |
| Brown & Son | 2,325 | 0 | 0 |
| Hickman | 2,295 | 0 | 0 |
| Sharpe & Robinson, Earls Barton (*accepted*) | 2,285 | 0 | 0 |

### WHITLEY.

For laying out and constructing the following streets on the Whitley North Links Estate, Northumberland, viz., Evesham Avenue, portion of Bournemouth Gardens, portion of Briar Avenue, Ashfield Grove, for the Whitley and Monkseaton Urban District Council. Mr. A. J. Rousell, A.M.I.C.E., surveyor.

| | | | |
|---|---|---|---|
| Walker | £1,954 | 6 | 0 |
| Starkey | 1,738 | 1 | 3 |
| Hollings | 1,616 | 12 | 11 |
| Thornton & Co. | 1,608 | 13 | 10 |
| Black | 1,604 | 16 | 6 |
| Henderson | 1,575 | 10 | 0 |
| Bunch | 1,565 | 12 | 0 |
| Fisher | 1,443 | 9 | 10 |
| Armstrong | 1,433 | 4 | 9 |
| Young, Newcastle (*accepted*) | 1,340 | 9 | 3 |

### WYCOMBE.

For erecting a pair of villas, Desborough Avenue. Mr. F. B Hooper, architect, High Wycombe and Great Marlow.

| | | | |
|---|---|---|---|
| Hopkins | £770 | 0 | |
| Siarey | 648 | 0 | |
| Jefferson | 615 | 0 | |
| Chapman | 570 | 0 | |
| Nash & Sons | 560 | 0 | |
| Morton & Sons | 548 | 0 | |
| Gibson & Sons | 527 | 0 | |
| Clarke | 510 | 0 | |
| Martin, Wycombe (*accepted*) | 462 | 0 | |

## TRADE NOTES.

The New Year has brought a welcome gift to some half a million of London householders, in the shape of a further reduction in the price of gas by the Gas Light and Coke Company. This time last year the company reduced its price from 2*s.* 10*d.* to 2*s.* 9*d.* per 1,000 cubic feet, and now a further drop to 2*s.* 8*d.* is announced—making a total reduction of 4*d.* per 1,000 feet in the past five years. Gas is so widely used in the home, not merely for lighting—in which field the economy and effectiveness of the inverted incandescent burner ensures its more than holding its own—but also as a cleanly and infinitely convenient substitute for coal, that this steady decrease in price means much to very many people. It will undoubtedly lead to a still greater consumption of gas for fuel, both in the home and in the workshop and factory. In view of the growing volume of testimony from medical and scientific men to the fact that a gas fire, properly designed and fixed and intelligently used, is actually more hygienic than a coal fire (in which unpurified gas is burnt), it is not surprising that the use of gas fires is extending this winter more rapidly than ever; whilst the cleanliness, the saving of labour, the certainty and perfect control of heat ensured by the use of gas for fuel in industrial processes are leading to the displacement of all labour-requiring, dirt, and ash-producing fuel by the heat which is instantly obtainable by the simple turning of a tap and applying a light. The policy which the Gas Light and Coke Company has adopted of late years seems destined to bear even greater fruit in the future.

Messrs. Austin & Co., lift builders, Newcastle-on-Tyne, have recently been instructed by the North-Eastern Railway Co. to erect two of their patent automatic push-button lifts at Sunderland passenger station; also two of a heavier type for the Middlesbrough passenger station. These orders have been placed with them chiefly on account of the great satisfaction that previous lifts of this type have given the North-Eastern Railway Co. Messrs. Austin & Co. have also in hand automatic electric passenger lifts for the North-Eastern Banking Co., South Shields; Lloyds Banking Co., Newcastle; the Alliance Insurance Co.'s new buildings, Newcastle; the Liberal Club buildings, Newcastle; and for John Grabham & Co., Newcastle. One automatic push-button electric passenger lift and two automatic electric goods lifts for Messrs. Tilley & Co.'s new premises, Newcastle; one electric lift for the Glasgow Corporation Electricity Works, and two for the Co-operative Wholesale Society's new banking premises, Manchester. They have also just completed an order for six electric high-speed lifts for the Co-operative Wholesale Society, Ltd., Newcastle, and one 20 cwt. electric passenger lift running at a speed of about 300 feet per minute. It is worthy of note that the Co-operative Wholesale Society have had over thirty electric lifts installed by Messrs. Austin & Co. at their different branches within the last few years, which alone should testify to the excellent satisfaction the lifts must be giving.

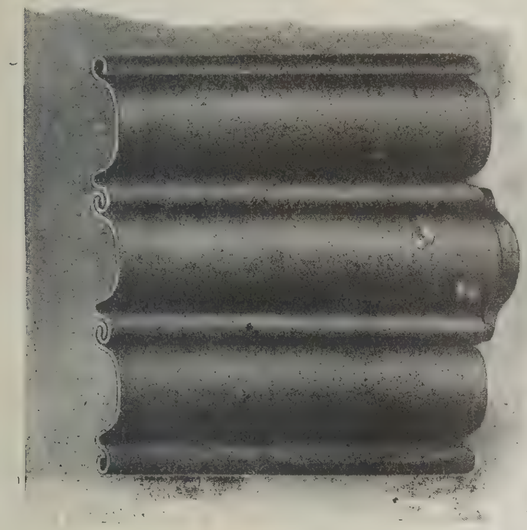
Messrs. E. H. Shorland & Brother, of Failsworth, Manchester, have just supplied their warm-air ventilating patent Manchester grates to the new Council schools, Kirby Muxloe. Amongst other recent contracts are the following:—The Sanatorium, Aldenham School, Herts., is being warmed and ventilated by means of patent Manchester stoves with descending smoke flues, patent Manchester grates, exhaust roof and special inlet ventilators; the extensions to the small-pox hospital, Wakefield, are being warmed and ventilated by means of their double-fronted warm-air ventilating Manchester stoves and Manchester grates; the extensions to the Victoria Hospital, Accrington, are being warmed and ventilated by double-fronted patent Manchester stoves with descending smoke flues, Manchester grates and ventilators.

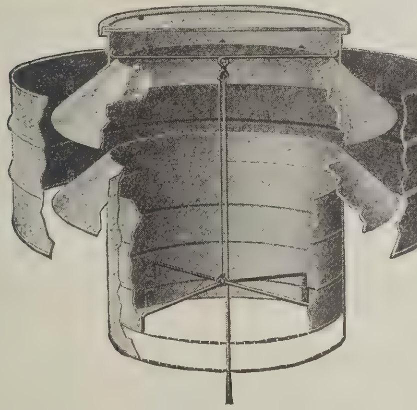
## NOTES ON INDUSTRIES.

During a period of trade depression, such as has been experienced more particularly in the building trade during the past two or three years (which now happily seems to be at an end, for the outlook is certainly brighter), it is a curious fact that in each section of manufacturers or suppliers of goods or materials there are to be found one or two firms who, while their competitors are mourning a decrease in the volume and value of their trade, continue to be fully occupied with orders, and even increase their output and in some instances find it necessary to extend their premises to meet the demand.

A solution to this may be found with very little consideration, however. In the first place these periods of depression chiefly touch those firms who depend upon supplying goods for the cheaper and smaller classes of buildings which are the first to be affected adversely, while advantage is taken of the lower cost of construction to put in hand buildings of a more important character, and goods of a higher grade are therefore in good demand to the advantage of the manufacturers of these.

But there is a further reason. In every branch of manufacture connected with the building trade will be found one or more firms who by the extra care given to the production of their goods, superiority of the workmanship and materials, combined with a justly earned reputation for reliability in the carrying out of orders entrusted to them, obtain an always increasing clientèle. When trade is brisk firms who make a similar class of goods, but are not in the above happy position, get their share of business, but as soon as the volume decreases they are the first to suffer, for when orders are scarce they are naturally placed where they will be best carried out.





A firm that has found it necessary to equip works in order to cope with increasing trade is Messrs. Arthur L. Gibson & Co., of Radnor Works, Strawberry Vale, Twickenham. Since they first introduced the Kinnear Patent Steel Rolling Shutters in this country, the demand has so steadily increased and has attained such dimensions that it could only be efficiently dealt with by the entire manufacture being under one control in works capable of meeting the rapidly growing output, and at Radnor Works these conditions are fulfilled.

The Kinnear steel rolling shutters answer all the purposes of revolving shutters hitherto in use, and in addition have been adopted for every class of opening. They are made in all widths up to 40 feet, and to any height, while the ease and speed with which they are manipulated, combined with economy of space, speedily proved their usefulness when applied, inter alia, to tramcar depots, generating stations, boiler houses, engine sheds, goods sheds, and warehouses.

Fourteen British railways have been supplied, as well as many Indian, Colonial, and foreign railway companies, tramway companies (including the London County Council tramway system), and numerous firms of the highest standing at home and abroad. On the occasion of our visit cases containing these shutters were being loaded into railway vans for despatch to various parts of the world.

An important use to which the Kinnear shutters are applied is for fire protection purposes in division walls. They have been examined and passed by the London County Council as meeting all the requirements of the Building Act, and are superseding in many instances iron doors hitherto in general use. For instance, they are fitted throughout Messrs. Selfridge's premises in Oxford Street, and are in use at Messrs. T. Wallis & Co., Ltd., Holborn; Messrs. Nicholson's, Ltd., St. Paul's Churchyard, &c.

They were tested by the British Fire Prevention Committee to illustrate the use of suitably constructed light steel revolving shutter doors in large vertical openings in checking the spread of fire. Two tests were made (*a*) with a set of two steel rolling shutter doors fitted on either side of a 14-inch wall, as for party wall door purposes, (*b*) with a single steel rolling shutter door, fitted on the inside of a 14-inch wall. To quote from the committee's report as published in their Red Book:—"The double shutter doors withstood the four hours test, remaining intact and workable at the conclusion of the test, no flame having passed through or around them. The single shutter door withstood the 2½ hours test, no flame having passed through or around it.

"Owing to the committee's testing plant sustaining damage during the conduct of these tests they had to be interrupted, whereupon water was applied on both sides of the shutters. The tests were subsequently continued, and the shutters which had already undergone an exceptional strain by fire and water, were again subjected to fire, and at the conclusion to water under pressure, with satisfactory results."

This result is principally due to the manner of construction. The old method of constructing revolving shutters was by connecting separate slats by hinges. As will be seen by the accompanying illustration, in the Kinnear shutters (formed of slats rolled out of light sheet steel), the slats form in themselves an interlocking hinge of extreme flexibility throughout their entire length, and possess great strength and rigidity with the least possible weight. Attached to the slats are malleable-iron end-locks to prevent lateral movement, and provide an excellent wearing surface.

The claim of the makers that the Kinnear shutter is fireproof, easily operated, simple, durable and efficient, appears to be well founded.

Another specialty of Messrs. Arthur L. Gibson & Co. is the Burt combination sky-light and ventilator, which we illustrate. The top is formed of heavy wired-glass, below which runs a trough to carry off and pass outside the ventilator any water caused by condensation. But the special feature consists of the sliding-sleeve damper which, when closed to prevent the outside atmosphere entering the building in times of storm, fog, or cold, still does not obstruct in the slightest degree the passage of daylight.

We have no space to describe more of this firm's specialties, but may mention the Cabot quilt, an effective sound-deadener and non-conductor for lining walls and floors.

To those who believe, and who now does not? that best results are only to be achieved in suitable surroundings, Radnor Works may be cited as ideal. They are well lighted and airy, in a great measure due to the Burt skylight and ventilator, well planned, and equipped for the work carried out there. We give a view inside one of the shops. Their position on the banks of the Thames in Teddington Reach ensures open, healthy and pleasant conditions for the workers.

## THE WARMING AND VENTILATION OF PUBLIC BUILDINGS AND FACTORIES.*

By T. W. ALDWINCKLE, F.R.I.B.A.

WHEN I received the honour of an invitation to read a paper on "The Warming and Ventilation of Public Buildings," I was encouraged to accept, for the reason that what I had to say on this very important subject would be addressed to those who, as engineers-in-charge, were thoroughly conversant with all the practical details of working, heating, and ventilation plant in public buildings, and that a very interesting discussion might result therefrom.

The subject of the paper is necessarily a very wide one, and the author's aim will be to deal mainly with general principles, taking typical cases to illustrate them, without attempting anything in any way to exhaust the subject.

Ventilation and warming are to some extent inseparable, and we shall have occasion during the course of this paper in many instances, to deal with them as one and the same subject; but ventilation, if not more important, is certainly a more difficult matter than its sister subject, and we shall deal with it separately in the first place, without necessarily excluding the subject of warming when the consideration of the latter is intermixed with that of the former.

### *Ventilation.*

It is, fortunately, unnecessary in these days, with an educated public opinion, to dwell upon the importance of ventilation in relation to health and personal comfort. The necessity for breathing pure air is now universally acknowledged, and all we have to consider to-night is what are the best and surest means to attain an end so generally desired.

Ventilation may be briefly described as the removal from a room, hall, or place of public assembly of the used or vitiated air, and the replacing of the same by pure external air. When this change is effected without draughts or other personal inconveniences, so that the air in the apartment remains pure, according to a standard varying with the nature of the occupancy of the room, that room is said to be efficiently ventilated, provided that a suitable temperature has been maintained therein.

At the outset we approach a matter of difficulty which must be adjusted before due consideration can be given to the subject, and that is the matter of climate. We must think of the subject from our point of view of ventilating and warming buildings in this country. The principal textbooks on the subject are either American or German, and we are apt to be guided by those textbooks, without remembering that the climate in those countries is very different from our own. In the first place, the climate in those countries is dry, whilst ours is humid. One result of this is that the internal temperature of the rooms is with them about 70° Fahr., whilst with us it is about 60° Fahr. With a humid climate such as ours, an internal temperature of 70° Fahr. is distinctly uncomfortable. Then again, the winter temperatures are different. It is usual in America, in calculating heating surface for warming apparatus, to assume the winter external temperature at the zero of Fahrenheit, or 32° of frost, and in Germany at 4° below zero. Now the English winter is not a pleasant one; it is long and disagreeable in a variety of ways; but we are not subject to very low temperatures, and in designing heating apparatus it is certainly not necessary to allow for an extreme external temperature of lower than 20° Fahr., if indeed so low. Thus we see that we must adjust the American and German systems to the conditions of our own climate before they can be serviceable to us.

As the primary object of ventilation is to provide pure air in rooms and halls, it is necessary to find some standard or standards of purity. The usual standard is a certain proportion of carbon dioxide ($CO_2$). Normal air contains three parts in 10,000 of $CO_2$ in the country, and about four parts in large towns. As human beings give off a certain quantity of $CO_2$ per hour, it is obvious that the number of parts in 10,000 will be increased in an inhabited room, and the object of ventilation is to prevent such an increase as shall be unhealthy or uncomfortable. There are other impurities produced in an inhabited room, such as watery vapour ejected from the lungs, dust particles, and exhalations from the skin and alimentary canal. There are also the products of gas combustion when the same is used as an illuminant.

It is generally accepted that to ensure a perfectly healthy room the added impurity of $CO_2$ should not exceed two parts in 10,000, making a total of 6 parts per 10,000. There are, however, many conditions in connection with inhabited rooms or halls, which render it well-nigh impossible to attain such a result, and we have then to be content with a standard which is not so good. This is generally the case with theatres and similar buildings, school class-rooms, and crowded factories.

The amount of $CO_2$ given off by persons is shown in cubic feet per hour in the following table:—

| | In repose. | In gentle exercise. | In hard work. |
|---|---|---|---|
| Adult male . . . | 0·6 | 0·9 | 1·8 |
| Adult female . . | 0·4 | 0·6 | 1·2 |
| Children . . . | 0·3 | 0·45 | 0·9 |

Gas as an illuminant produces in combustion a little more than ½ cubic foot of $CO_2$ for each cubic foot of gas burnt, and about double this quantity of aqueous vapour. Gas combustion also produces other impurities, such as carbon disulphide, &c. The introduction of the incandescent gas mantle, however, by reducing the amount of gas burnt per candle-power, has considerably reduced the impurity from this source, while there are no impurities resulting from the electric light.

Human beings produce a certain quantity of heat, which is expressed in units of heat per hour, and this is, according to Pettenkofer, about 400 units for adults, and 200 for children in an atmosphere of 70°.

From these tables it will be apparent that the occupants of a room exercise a very considerable influence upon the purity of the air, and upon its temperature.

As to the amount of fresh air per head which should be supplied, authorities differ somewhat, some of the suggested quantities being quite impracticable; but the following may be taken as reasonable, and capable of being put into execution under normal conditions.

| Class of building. | Cub. ft. of air per person per hour. |
|---|---|
| Hospitals (ordinary) . . . . . | 3,000 to 5,000 |
| ,, (fever) . . . . . | 6,000 |
| Workshops . . . . . . | 1,000 |
| Theatres . . . . . . . | 500 to 1,000 |
| Halls of assembly . . . . | 1,000 |
| Class-rooms (elementary schools) . . | 1,000 to 1,500 |

In deciding the amount of air to be provided per head, regard should be had to the period during which the room or hall will be occupied. Thus hospital patients occupy the ward by day and by night, and therefore require a higher standard of purity in the air than the audience at a theatre or concert-hall, who are only in the building about three hours.

The cubic space per head is not so important as might be imagined, so long as the requisite amount of fresh air is supplied without draughts and at a suitable temperature. A room may have a large cubic space per head, and yet, from imperfect ventilation, the amount of $CO_2$ may be found to be unusually high. An interesting illustration of this is to be found in Haldane's Departmental Report on the Ventilation of Factories and Workshops (CD 1302), (1902). The instance quoted was a cotton spinning mill, having a cubic space of over 10,000 feet per worker, where, owing to the absence of suitable ventilation, the $CO_2$ rose to 16.5 parts per 10,000, and this with a high internal temperature, viz., 92° Fahr., and without gas lighting.

Now, the aim of a designer of a system of ventilation is to produce good results, having in view the figures contained in the foregone tables, and we must bear in mind that no rigid system can be successfully applied to all buildings alike, but that the nature of the building, and the purposes for which it is intended, must be separately considered in each case, and as there are numerous methods of ventilation, both natural and mechanical, we have several good systems from which to make a wise selection.

Systems of ventilation may be divided into two main classes—natural and mechanical. Natural ventilation is

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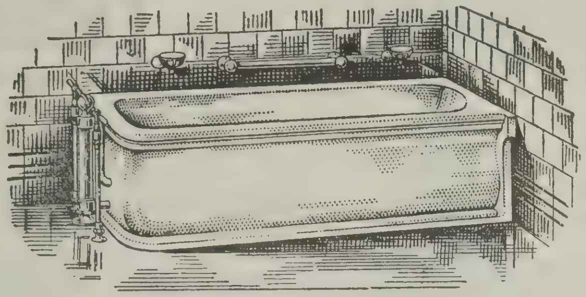
* A paper read before the Association of Engineers in-Charge on January 12.



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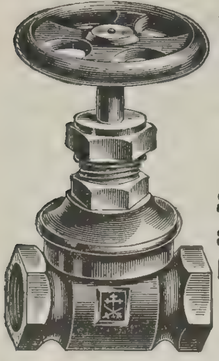

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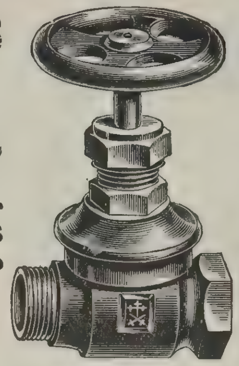

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understood to be that which is produced by open windows, skylights, vertical ventilating tubes, and open fireplaces or radiators, or, at all events, where any movements of the air are due to natural causes, and not to mechanical power. Mechanical ventilation, on the other hand, comprises all those systems by which the movements of the air are due to mechanical power of some kind or another. There is a tendency nowadays to take sides on this subject, and to be an enthusiastic supporter of one or other of these two main systems, without reference to the varying classes of building, but this does not help us to arrive at a correct decision.

Our climate lends itself to natural ventilation because it is a temperate one, admitting of open windows, and this system of ventilation, which is the cheapest of all systems, is suitable for most domestic purposes—for offices, committee rooms, entrance halls, corridors, staircases, and factories and workshops having a large cubic space per worker. For rooms and offices open fireplaces are much preferable to radiators as a means of warming, as they are exhaust ventilators, and induce a current of air to flow in through the open windows. Nothing is more oppressive than to have to sit for some hours in a room where there is a radiator and no open fireplace. As regards staircases and corridors, it is not necessary to put them under a plenum or exhaust system. Radiators with open windows will be quite sufficient for all purposes. Generally speaking, with a climate favourable to natural ventilation, I think that every effort should be made to use this system wherever practicable.

The so-called natural ventilation with vertical pipes and cowls, or other terminals, is not to be relied upon, as these are all dependent upon the action of the wind to produce an upward current, and are, therefore, perfectly useless when the external air is still and close.

A hospital ward is also an instance where our climate lends itself to natural ventilation. I believe that the great majority of medical superintendents of hospitals will tell us that there are from 300 to 330 days in the year when the windows of a ward can be opened without injury to the patients. This at once obviates the necessity for close mechanical ventilation. I will just describe to you the ideal ventilation of such a ward. In the first place you have good cross ventilation. The windows will be on both sides, and will extend from 2 feet 6 inches above the floor to close up to the ceiling. There will be double-hung sashes, finishing at the top with a transome, and a hopper ash, to open in glazed cheeks. Thus the rate and position of the admission of the fresh air can easily be regulated. There will also be cold, fresh air inlets in the external walls at the floor line to prevent the accumulation of vitiated air at that level. There may be also supplementary inlets in the side walls admitting air, to be passed through low-temperature, hot-water radiators, for use in very cold weather. Lastly, you have the large open fire-places in the centre of the ward radiating heat, a bright and cheerful view for all the patients, and withal powerful exhaust ventilators, removing the vitiated air at a velocity of about 6 feet per second, close to the floor level. Some may say that this is not scientific ventilation and warming. It may not be, but its results cannot be challenged.

In this connection it may not be out of place, although anticipating a little, to consider the alternative of mechanical ventilation in relation to a hospital ward. I regard the plenum system as entirely unsuitable, for the following reasons:—As the air will have to travel a considerable distance from the fan to the several inlets to the ward, it has to be warmed to a high temperature to start with, in order that it may enter the ward sufficiently warm. Then it has to pass along a series of ducts difficult of access for cleaning purposes. Anyone conversant with the plan and section of a ward pavilion will understand this. Exhaust ventilation is more suitable for a ward than the plenum, but it is not equal to natural ventilation, on account of the absence of open fireplaces and the necessity for closed windows. This system was adopted at the South-Eastern Hospital carried out by me in 1905, in deference to the wishes of the Committee, who desired to dispense with open fireplaces, so as to avoid the expense of labour in attending to them, and the dust arising therefrom. The extraction is by means of propeller fans in vertical shafts removing 6,000 cubic feet of used air per bed per hour. The inlets for fresh air are in the side walls under the windows, and the air is warmed in winter by impinging upon low-pressure, hot-water radiators enclosed in removable cases, the inlets being capable of regulation. The heating surface of the radiators on the east, or colder, side of the ward is 10 per cent. in excess of that on the west side. One important matter must be borne in mind in relation to an exhaust system of ventilation in a ward, and it is that the extracting power of the fans may draw in the air from undesirable inlets, such, for instance, as from the sanitary turret. To obviate this at the South-Eastern Hospital I provided a separate fan to extract the air independently from the sanitary turret, of sufficient power to resist any pull in the direction of the ward.

*(To be continued.)*

## CALENDARS, DIARIES, &c. FOR 1910.

THE "Therol" system enables electricity to be supplied at competitive prices for everything; the "Therol" calendar illustrates ten uses including for cookers, boilers, sewing machines and hair curlers. Calendars also come from the Central Fire Insurance Co., Ltd., 1 Cornhill, E.C., and the *Estates Gazette.*

MESSRS. GEO. ROWNEY & Co. have issued the thirty-fifth "Artists' Almanac." It contains its usual very complete list of fine-art galleries, museums, societies, &c., in London, and the provinces. The compilers state that they have taken great pains to procure for intending exhibitors correct information respecting the dates of taking in pictures, and the opening of the different exhibitions. Messrs. Rowney & Co., act as London agents and will collect, pack, and forward pictures to any part of the country.

"WILLING'S Press Guide for 1910" (1*s*.), is something more than a reprint of that for the previous year. It has been both revised and enlarged, though the edition of 1909 was so exhaustive and so accurate that it was only necessary to make very slight alterations. The name of Willing is itself a guarantee of practical utility.

THE Sussex Portland Cement Co., Ltd., of Newhaven (makers of the well-known "Cathedral" and "Newhaven" brands), issue a wall calendar for 1910, which should prove acceptable to all. The design is a striking one, and includes a view of Arundel Castle, the residence of the Earls of Arundel for 800 years. The massive keep contains Saxon work, and stands on an artificial mound, 76 feet high. The castle generally was rebuilt in the style of the thirteenth century under the late Mr. C. A. Buckler, architect, of London. The restoration of the keep, which extended over several years, was completed in 1905; large quantities of "Newhaven" brand of Portland cement were used. The "Cathedral" quality cement, of which this company make a special feature, is acquiring a reputation for the restoration of historical buildings; it was recently selected for important work at Canterbury Cathedral. Copies of the calendar may be had on application to the head office of the company, at Newhaven, Sussex.

THE Wouldham Cement Co., Ltd., undoubtedly determined to do things on a big scale when they arranged that their block wall calendar should measure in all 24 inches by 14 inches. The actual numeral for each day of the year is 9 inches high, and it stands out boldly in red against a white margin 6 inches broad on either side. It is worthy of note that the company restrict their own announcements to a headpiece, and a narrow strip at the foot. The Wouldham calendar certainly eclipses any that we have seen this year in forcibleness.

## VARIETIES.

THE surveyor to the Maidstone Urban District Council is preparing plans and estimates for a strong room at the town hall and at the museum.

WE hear that the Pearl Life Assurance Company have purchased land in Kingsway and are about to erect handsome offices.

IT is understood that large cutlery works are to be erected at Tees-side by a firm of Sheffield manufacturers, at a point between South Bank and Grangetown.

A NEW higher grade school is to be erected at Banff, N.B., as soon as possible at a cost of over 6,000*l*. The plans have been approved by the authorities.

THE Berkshire local education authority propose to provide a new public elementary school (by enlargement of the existing Council school) for about 120 children at Lower Sandhurst.

THE Horwich District Council propose to provide an open-air bath, 100 feet by 40 feet, with dressing-rooms, bandstand, &c., on the site of the Old Mill, in Mill Lane. The total cost, inclusive of the site, is estimated at 2,050*l*.

THE Northamptonshire education committee recommend the County Council to agree to an expenditure of just under 10,000*l*. on a girls' Secondary school for 215 pupils, to be erected at Wellingborough.

Messrs. Potts, Son & Hennings, architects, Bolton and Manchester, have designed large extensions for the premises of the Bolton Operative Spinners' Association. The main improvement will be the provision of two halls, one for 750 people, the other for 400.

At the last meeting of the executive of the buildings committee for the upper district of Renfrewshire, plans were approved of several buildings of the total value of 22,058*l.* The value of the linings granted in the corresponding period of last year was 10,260*l.*

Urr School Board have decided on a large extension of Dalbeattie School. The new building will consist of three class-rooms to accommodate 130 pupils, with hall, teachers' room, &c., and the estimated cost is at the rate of 10*l.* to 11*l.* per pupil.

The Gillingham Council have informed the owners of a new estate at Wigmore that they were prepared to accept their offer of a park and to fence it in, but that they could not agree to form roads as suggested or bind themselves as to laying out the ground.

The Kirkby-in-Ashfield Council are applying to the Local Government Board for permission to raise the following loans:—Public offices, 1,750*l.*; market hall, 1,000*l.*; parks, 500*l.*; sewage, 3,000*l.*; water works, 1,500*l.*; contingencies, 250*l.*; total, 8,000*l.*

The Autolock Safety Cock and Bolt Company, Ltd., 317 High Holborn, W.C., have put on the market a gas cock that cannot be accidentally turned on, a window-fastener that cannot be shot back from the outside, and a door bolt that automatically and securely locks itself. All three are "Visor" patents and make highly useful fittings.

A Local Government Board inquiry was held last week at Belfast by Mr. P. C. Cowan, M.Inst.C.E., into an application for sanction to loans of 62,200*l.* and 20,000*l.*, for (1) the extension of the electricity works, and (2) for footpaths and street improvements. The present electrical plant is capable of producing 4,000 kilowatts, and the application was to extend the plant, taking the total capacity to 5,500 kilowatts.

With the first number of the New Year the price of the *Guardian* was reduced from 3*d.* to 1*d.* The editorial note says:—"We do not desire that the contents of the paper should be less accurate or less learned than of old, but we recognise that those contents should be so set forth as to make a quicker appeal to a larger and more comprehensive audience."

The Consett Urban District Council have instructed Messrs. D. Balfour & Son, civil engineers, 3 St. Nicholas Buildings, Newcastle-on-Tyne, to prepare a scheme of main sewerage for the Park Road and Templetown districts, the sewage from which is to be conveyed by main outfall sewers to the disposal works, which are to be enlarged.

The Nottingham City Council, by 31 votes to 19, carried the following resolution:—"That it be an instruction to the finance committee to consider and report as soon as possible upon the possibility of fixing the next general rate at such a figure as will admit of a preference of 10 per cent. being given to all ratepayers who remit the amount of their rates to the rate office within one month after demand has been made."

The Zoological Society of London have just issued the seventh edition of the Official Guide to the Society's Gardens. It consists of 112 pages and contains 51 illustrations, and index, railway and street map, showing points of access from different parts of London, and a ground plan of the Gardens. Copies in stiff covers can be had, price with postage 7½*d.*, or in green cloth, price 1*s.* 2*d.*, on application to the offices, 3 Hanover Square, W.

The Local Government Board have written to the Worcester City Council declining to hold an inquiry as to the desired extension of the city boundary until they are satisfied that the sewerage disposal works are working satisfactorily. The Council's sewerage works, which cost 100,000*l.*, are at present ineffective, and it was proposed at the last Council meeting to put in a deep sewer at an additional cost of about 10,000*l.*

Negotiations are proceeding between Earl Carnarvon and Mr. Banks-Crawford, of Hill Croft, Nottingham, for the purchase by the latter of Bretby Hall and a portion of the estate. Should the terms be arranged Mr. Banks-Crawford will take the hall and the agricultural portion of the estate on the south side, leaving the collieries and other mining property still in the hands of the earl. A condition of the purchase is the expenditure on the hall of 30,000*l.*

A party of Germans interested in refrigeration processes recently visited Liverpool for the purpose of studying the methods adopted in that city. The party consisted of editors of technical journals devoted to refrigeration, engineers, architects, cold storage builders, and merchants. They are all members of a society recently formed for promoting the interests of refrigeration. Their intention is to visit several towns in England in which refrigeration plant on a large scale is in use. Liverpool, being prominent in this respect, was the first provincial town to receive their attention.

The Electric Picture Palaces (Midland), with a share capital of 50,000*l.* and debenture stock of 16,500*l.*, has been formed to erect and operate a number of electric picture theatres in the Midlands. The company proposes to commence with the erection of six "living picture" theatres. Options for leasing sites for five of these have been acquired in Walsall, West Bromwich, Smethwick, Darlaston, and Wolverhampton, and negotiations for a suitable site at Handsworth are pending. The architects are Messrs. Hickton & Farmer, Walsall, and Martineau Street, Birmingham.

It is proposed to erect a permanent church (St. Augustine's) at Belvedere for the mechanics and artisans at Woolwich Arsenal and neighbouring works. The population numbers nearly five thousand. Plans have been prepared, and the estimated cost is 7,000*l.* The building committee are anxious to start the first portion, which will include the chancel, choir, and clergy vestries, and four bays of the nave and aisles to accommodate five hundred. The cost will be 4,050*l.*

The Haywards Heath Urban Council at their last meeting considered a letter from Mr. J. Bradford, J.P., of Brighton and Haywards Heath, offering to build a block of six attractive-looking almshouses and to endow them with a sufficient sum to keep them in repair, for the use of old, respectable inhabitants of Haywards Heath, of sixty-five years of age, preference being given to the members of the Foresters' Order, other things being equal. The offer was conditional upon a site being given for the purpose or sold to him for a nominal sum. The Council decided to ask the Local Government Board to sanction their giving a piece of land.

Mr. A. B. Holmes, the consulting electrical engineer, in a report to the Liverpool Corporation on the charges for electric supply, calls attention to the reduction of the supply to private houses arising from the adoption of the metallic filament lamp. This reduction, he suggests, can be met by encouraging consumers to instal the electric light throughout their houses (instead of only partially as is frequently the case), and also to make use of electric radiator irons, kettles, cooking apparatus and other domestic appliances which are supplied at power rates, but the use of which has hitherto been almost prohibited by the cost of a second meter and independent system of wiring for the power rate supply. He recommends the trial for a period of twelve months of charging for private houses of not less than 20*l.* rateable value a fixed quarterly payment of 3 per cent. on the rateable value of the house and 1*d.* per unit on each unit as measured by the meter.

The Decorative Art Journals Company, Ltd., have brought out a valuable publication under the title of "The Dining Room" (London: Simpkin, Marshall, price 3*s.* 6*d.*). Its purpose is to show how artistic effects in the decoration of this important apartment may be produced "by simple means within the compass and skill of almost any decorator, and at a cost within the reach of the average householder." An important feature is the six beautifully coloured plates illustrating (1) a Blue Room, by Mr. W. W. Davidson; (2) a Red Room, by Mr. R. G. Barker; (3) a Grey Room, by Mr. R. G. Barker; (4) a Green Room, by Mr. G. M. Atkins; (5) a Brown Room, by Mr. W. H. Gaskell; and (6) a Blue Room, by Mr. W. G. Sutherland, junr. Each is accompanied by a chapter from the artist concerned, giving his views on the elements of internal decoration in general and details of his own scheme in particular. The opening scheme is especially attractive, but Mr. Davidson was thinking surely of somebody more wealthy than the average householder. The requirements of the latter are, however, ably catered for by the other decorators, notably in the Green Room, by Mr. George M. Atkins. Here, as in four out of the five remaining schemes, the walls are divided perpendicularly into panels, and depend for much of their effect upon the deep frieze. Another common characteristic is that the decoration does not follow any of the Period styles, for even the Early Renaissance interior by Mr. W. Davidson has its own personality. The letterpress is no less interesting than the plates and sketches, for each of the decorators has sought to explain his guiding principles, and perhaps, happily, to make converts among those who still remain indifferent to the desire for a beautiful and appropriate environment.

THE
Architect and Contract Reporter.
FRIDAY, JANUARY 21, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

A MANUFACTURING firm, requiring extensions to their works, comprising dining halls (together with kitchens and stores) to accommodate 3,000 girls and 1,500 men respectively, will be glad to hear from architects who have had experience in designing and executing such buildings. Applicants must state their experience in designing buildings having good acoustic properties, besides being suitable for dining arrangements. See advertisement for full particulars.

BLYTH.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

IRELAND.—Jan. 31.—The Pembroke Urban District Council, Co. Dublin, invite schemes and estimates for laying out Herbert Park (35 acres). Mr. J. C. Manly, Clerk, Town Hall, Pembroke, Co. Dublin.

LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l*., 50*l*., and 25*l*. for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l*. 2*s*. Secretary, John W. Fawcett, 10 Albion Street, Leeds.

MARCH 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l*., 30*l*., and 20*l*. are offered, together with 5*l*. for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Apply before Feb. 10 to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l*. and 5*l*. Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l*. 2*s*. Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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## CONTRACTS OPEN.

Belfast.—Jan. 25.—For erection of proposed abattoir in Stewart Street. Deposit 5*l*. 5*s*. The City Surveyor, City Hall, Belfast.

Bognor.—Jan. 21.—For supply of a new bandstand, 24 feet diameter; price not to exceed 235*l*. Mr. H. L. Staffurth, clerk, Council offices, Bognor, Sussex.

Bradford.—Feb. 4.—The West Riding Education Committee invite whole or separate tenders for Provided school alterations (builder, joiner, plumber, and painter), Bradfield, Oughtibridge. The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

Bridlington.—Jan. 24.—For alterations and additions to West End House. Messrs. Broderick, Lowther & Walker, architects, 77 Lowgate, Hull.

Bristol.—Jan. 26.—For erection of ten cottages at Avonmouth, for the watch committee. Deposit 1*l*. 1*s*. Mr. Peter Addie, city valuer, The Exchange, Bristol.

Cartmel.—Jan. 31.—For alterations and additions to the King's Arms Hotel, Cartmel, Lancs. Messrs. J. W. Grundy & Son, architects and surveyors, Central Buildings, Ulverston.

Cleckheaton.—Jan. 25.—For the erection of a partition at Westgate Provided Infants' School, Cleckheaton. The West Riding County Council Education Offices, Heckmondwike.

Dartmouth.—Jan. 31.—For erection of a house at Mount Boone. Mr. W. Percy Marr, A.R.I.B.A., architect and surveyor, Dartmouth.

Devonport.—Feb. 7.—For the erection of nursing staff quarters and reconstruction of the Military Families Hospital at the Raglan Barracks. Deposit 10*s*. Apply by January 23 to the Director of Barrack Construction, 80 Pall Mall, London, S.W. (see advertisement).

Dewsbury.—Jan. 27.—For the erection of out-offices for the Girls' Department of the Carlton Street Council School. The Borough Surveyor's office, Town Hall, Dewsbury.

Driffield.—Jan. 28.—For the construction of a rifle range at the local headquarters of the Territorial Force. Mr. T. Casson Beaumont, surveyor, Driffield.

East Molesey.—Feb. 3.—For erection of an isolation hospital within their district, for the East and West Molesey Urban District Council. Send 1*l*. 1*s*. deposit to the Clerk to the Council. Messrs. Foster, Lovell & Lodge, architects, 23 Old Queen Street, London, S.W.

Ebrington.—For the enlargement of the elementary school at Ebrington, Gloucestershire. Mr. M. A. Sands, official correspondent, Ebrington Hall, Campden.

Edinburgh.—Jan. 24.—For the following works in connection with alterations to be carried out at No. 15 Duncan Street, for the Edinburgh School Board:—(1) Mason work; (2) carpenter and joiner works; (3) plumber work; (4) slater and plaster works; and (5) painter work. Mr. Carfrae, architect, 3 Queen Street, Edinburgh.

Enfield.—Feb. 7.—For the construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, Enfield, for the Metropolitan Water Board. Send 10*l*. deposit to the Accountant at Savoy Court, Strand, W.C. The Chief Engineer, Savoy Court, Strand, W.C.

Exmouth.—Jan. 24.—For carrying out alterations at the Foresters' Arms, Chapel Street. Mr. P. Kerley, architect and surveyor, National Provincial Bank Chambers, Exmouth.

Gillingham.—Jan. 24.—For making the necessary foundations, &c., for one 200 horse-power Diesel oil-engine and alternator, at the generating station, Gillingham Road. The Borough Electrical Engineer, the Generating Station, Gillingham Road.

Glasgow.—Feb. 1.—For the following works required in connection with proposed alterations and additions to tramway depot at Maryhill:—(1) Digger, mason, and brick works; (2) carpenter and joiner works; (3) cast iron and steel works; (4) patent roof glazing; (5) slater work; (6) plumber work; (7) painter work. Deposit 2*l*. 2*s*. Mr. Jas. Dalrymple, general manager, 46 Bath Street.

Guildford.—Jan. 28.—For supply of all material for and the erection of nine arches, one main flue, and one chimney at the gasworks, Onslow Street. Deposit 1*l*. 1*s*. Mr. P. C. Cleasby, Gasworks, Guildford.

Halifax.—Jan. 28.—For erection of offices and cartsheds at Springwood Mills, Holywell Green, for Messrs. R. & J. Holroyd. Mr. Fred F. Beaumont, architect, Southgate Chambers, Halifax.

Halifax.—Jan. 26.—For the reinstating of Kingston Confectionery Works. Messrs. Medley Hall & Sons, architects and surveyors, 1 Harrison Road, Halifax.

Ireland.—Jan. 24.—For building twenty-three single labourers' cottages and for fencing twenty-seven plots, for the Rathdrum Rural District Council. Deposit 5*s*. Mr. B. Manning, clerk, Rathdrum, Ireland.

Ireland.—Feb. 7.—For the erection of mortuary and disinfecting establishment, Arbor Hill Hospital, Dublin. Deposit 10*s*. Apply by January 28 to the Director of Barrack Construction, 80 Pall Mall, London, S.W. (see advertisement).

King's Norton.—Jan. 26.—For the erection and completion of public baths at the corner of Hazelwell Street and Bournville Lane, Stirchley. Contracts: (1) The buildings, (2) the steam and water services, (3) the boiler, and (4) the laundry machinery. Deposit 1*l*. 1*s*. each. Apply by Jan. 26 to Mr. E. Docker, clerk to the King's Norton and Northfield Urban District Council, 10 Newhall Street, Birmingham.

Leeds.—Jan. 27.—For the erection of a urinal in Meanwood Road. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Lincoln.—Feb. 8.—For construction of engine house, boiler house, economiser house, cold store, workshop and stores forming the main building; and chimney, engineer's house, cottages, and subsidiary works, at Elkesley, Notts, 2¾ miles from Checker House Station, and 6 miles from Retford, for the Lincoln Corporation. Send 5*l*. 5*s*. to the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

Lincoln.—Jan. 24.—For erection of a public elementary school on Spring Hill. Deposit 1*l*. Apply by January 24 to Mr. W. G. Watkins, architect, Bank Street, Lincoln.

Liverpool.—Jan. 26.—For the construction of a public washhouse at Netherfield Road North, and also for the engineering work required therein. Deposit 1*l*. 1*s*. Mr. W. R. Court, engineer and chief superintendent, Municipal Offices, Liverpool.

London.—Jan. 25.—For erection of a coroner's court at High Street, Poplar, E., for the London County Council. Deposit 2*l*., with the cashier of the Council, at the County Hall, Spring Gardens, S.W. The Superintendent Architect's Department, General Section, 19 Charing Cross Road, W.C.

London.—Jan. 25.—For repairs to the roof of the Relief Hall and new flat roof with lantern lights above the Relief Offices in Bishop's Road, Victoria Park, N.E., for the Bethnal Green Board of Guardians. Send 2*l*. 2*s*. deposit to Mr. D. Thomas, clerk, Bishop's Road, Victoria Park, N.E. Mr. W. A. Finch, architect, 76 Finsbury Pavement, E.C.

Mansbridge.—Jan. 24.—For the construction of a concrete retaining bank on the Botley Road, at West End Mill, near Mansbridge, for the Hants County Council. Deposit 1*l*. 1*s*. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Manchester.—Jan. 26.—For erection of wash baths and washhouses at Miles Platting. Deposit 2*l*. 2*s*. The City Architect, Town Hall.

Margate.—Feb. 7.—For alterations to cottages at the Wingham pumping station, and also the redecoration of the interiors. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

Milnthorpe.—Jan. 26.—For the whole or any separate trades required in erection of a police station at Milnthorpe, Westmorland. Apply by Jan. 22 to Mr. J. Bintley, county surveyor and architect, 7 Lowther Street, Kendal.

Nelson (Lancs.).—Jan. 29.—For the following works required in connection with the alteration of the technical school premises in Market Street:—(1) Mason, bricklayer and drainer; (2) joiner and carpenter; (3) painter; (4) plasterer; (5) plumber. Mr. B. Ball, A.M.I.C.E., borough engineer and surveyor, Town Hall, Nelson.

Nottingham.—Jan. 28.—For erection of a golf pavilion at Bulwell Hall Park. Deposit 1*l*. 1*s*. Mr. Frank Lewis, city architect, Guildhall.

Peterborough.—Jan. 24.—For labour (bricklayers or builder) in erection of a pair of houses in Queen's Walk, Fletton. The Co-operative Society, Park Road, Peterborough.

Pettaugh.—Feb. 7.—For erection of a new school for about 60 children at Pettaugh, near Stowmarket. Deposit 1*l*. 1*s*. Send names to Mr. W. E. Watkins, secretary, Education Office, County Hall, Ipswich.

Portsmouth.—Jan. 25.—For additions to the boys' secondary school, Victoria Road North, Southsea. Mr. A. H. Bone, architect and surveyor, Cambridge Junction, Portsmouth.

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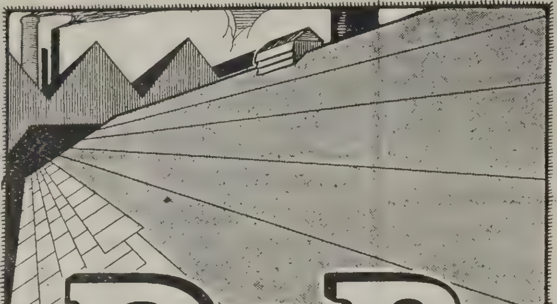

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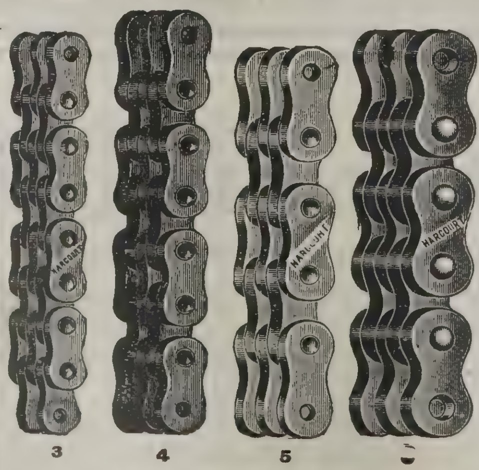

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**ST. AUSTELL (CORNWALL).**—Jan. 29.—For erection of two concrete cottages at Polkyth, St. Austell. Mr. F. Adams, Trewoon, near St. Austell.

**SCOTLAND.**—Jan. 26.—For the following trades, viz., mason, joiner, plumber, slater, and plaster works of proposed double villa, Home Park, Aberdour. Messrs. W. & C. Scott Cullen, architects, 83 High Street, Cowdenbeath, and East Aberdour.

**SCOTLAND.**—Jan. 28.—For the mason and brickwork, the joiner, plumber, plaster and slater work of extension to the Ovenstone Hospital, Pittenweem. Mr. Henry, architect, St. Andrews.

**SCOTLAND.**—Feb. 9.—For foundation work for barrack block, excavating and levelling site for new cavalry barracks, Redford. Deposit 10*s.* Apply by February 1 to the Director of Barrack Construction, 80 Pall Mall, London, S.W. (see advertisement).

**SHARPNESS.**—Feb. 12.—For erection of a new school at Newtown, Sharpness, Gloucestershire. Deposit 2*l.* 2*s.* Apply by January 24 to Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

**SHEFFIELD.**—Jan. 31.—For the whole of the work to be done in the extension of Women's Hall of Residence, Ecclesall Road and Collegiate Crescent; also for heating apparatus and electric installation. Messrs. Gibbs, Flockton & Teather, architects, 15 St. James's Row, Sheffield.

**SPURSTOW.**—Jan. 26.—For alterations and additions to the school buildings, Spurstow, near Tarporley, Cheshire. Deposit 1*l.* Mr. H. Beswick, county architect, Newgate Street, Chester.

**TERRINGTON ST. CLEMENT (NORFOLK).**—Jan. 24.—For the execution of alterations and additions to house. Deposit 1*l.* 1*s.* Messrs. Walker & Walker, architects and surveyors, Wisbech, Terrington, Norfolk.

**THORNTON-IN-CRAVEN.**—Feb. 4.—The West Riding education committee invite whole or separate tenders for the following work:—Thornton-in-Craven, Earby new school (builder, joiner, slater, plasterer, plumber, painter). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, County Hall, Wakefield.

**WALES.**—Jan. 24.—For erection of two shops and premises at Blackwood, Mon. Mr. D. J. Thomas, architect, High Street, Blackwood, Mon.

**WALES.**—Jan. 24.—For erection of a filter and meter house at Ynis-y-Fro reservoir, for the Newport (Mon.) Corporation. Deposit 1*l.* 1*s.* with the Borough Treasurer. Mr. R. H. Haynes, water engineer, Town Hall.

**WALES.**—Jan. 24.—For alterations and additions to premises in Morgan Street, Pontypridd. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

**WALES.**—Jan. 25.—For building a masonic temple for the Loyal Cambrian Lodge of Freemasons, No. 110, at Merthyr Tydfil. Mr. C. R. Davies, architect, 112 High Street, Merthyr.

**WALES.**—Jan. 25.—For erection of an English Presbyterian Chapel at Williamtown, Penygraig. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects, Church Street Chambers, Pontypridd.

**WALES.**—Jan. 26.—For the extension of the Queen Street infants' school, Abertillery. Deposit 1*l.* 1*s.* Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

**WALES.**—Jan. 27.—For additions and alterations to house, Cae Glas, and all other work in connection therewith, for the Oswestry Town Council. Deposit 10*s.* 6*d.* Mr. G. William Lacey, C.E., borough engineer and surveyor, Guildhall, Oswestry.

**WALES.**—Jan. 27.—For additions and alterations to buildings for conveniences, shelters, &c., at Cae Park, and all other work in connection therewith, for the Oswestry Town Council. Deposit 10*s.* 6*d.* Mr. G. William Lacey, C.E., borough engineer and surveyor, Guildhall, Oswestry.

**WALES.**—Jan. 28.—For alterations to the Express Inn, High Street, Merthyr Tydfil. Mr. C. M. Davies, architect, Merthyr Tydfil.

**WALES.**—Jan. 29.—For erection and completion of a house at St. Dogmaels, Cardigan. Mr. J. Teifion J. Williams, architect, Napier Street, Cardigan.

**WALES.**—Jan. 29.—For erection of premises at Treherbert, for the Conservative Club. Deposit 2*l.* 2*s.* Mr. J. Rees, architect, Pentre.

**WALES.**—Feb. 7.—For the proposed riding school and stabling to be erected on the Barracks Field, Cardiff. Deposit 1*l.* 1*s.* Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

**YARM.**—Feb. 2.—For alterations and improvements at the Yarm Council School, for the North Riding of Yorkshire County Council. Apply to the master or caretaker, Council School, Yarm, Yorks.

## TENDERS.

### AXMINSTER.

For the erection of six villas, for the Axminster Development Syndicate, Ltd., on the Hakes Building Estate. Messrs. SYMES & MADGE, architects and surveyors, Chard.

| | | | |
|---|---|---|---|
| Finsland | £1,500 | 0 | 0 |
| Parsons Bros. & Dunster | 1,402 | 0 | 0 |
| Bishop & Son | 1,380 | 0 | 0 |
| Bazley | 1,255 | 0 | 0 |
| NEWBERY & SON, Axminster (*accepted*) | 1,236 | 0 | 0 |

### BARNSTAPLE.

For erection of new Wesleyan Chapel at Newport, Barnstaple. Mr. A. LAUDER, architect, Barnstaple.

| | | | |
|---|---|---|---|
| Cater & Son | £1,191 | 0 | 0 |
| Woolway & Son | 1,170 | 0 | 0 |
| Sillifant & Sons | 1,159 | 0 | 0 |
| Karslake | 1,137 | 10 | 6 |
| COOKE & SONS, Barnstaple (*accepted*) | 1,090 | 0 | 0 |

### CAMBRIDGE.

For new drainage, Fulbourn Asylum. Messrs. MACALISTER & SKIPPER, architects, Cambridge.

| | | | |
|---|---|---|---|
| Brebner & Co. | £1,929 | 15 | 0 |
| Beattie | 1,798 | 0 | 0 |
| Redding & Sons | 1,595 | 0 | 0 |
| Bailey | 1,547 | 9 | 11 |
| Nunn & Co. | 1,508 | 10 | 0 |
| Lown & Co. | 1,488 | 15 | 9 |
| Shanks | 1,350 | 0 | 0 |
| Scott | 1,290 | 13 | 0 |
| Kidman Bros. | 1,282 | 4 | 6 |
| Willmott & Sons | 1,261 | 0 | 0 |
| Dean & Perkins | 1,148 | 10 | 10 |
| A. M. MACDONALD, Nottingham (*accepted*) | 1,075 | 6 | 7 |

### CHIPPING SODBURY.

For the construction of a system of sewerage for the parish of Filton, for the Chipping Sodbury Rural District Council. Messrs. A. P. I. COTTERELL & CARR, engineers, 26 Victoria Street, Westminster, and Bristol.

| | | | |
|---|---|---|---|
| Dare & Co. | £9,270 | 0 | 0 |
| Nunn & Co. | 8,348 | 7 | 6 |
| J. & T. Binns | 7,657 | 19 | 0 |
| Wickstead & Co. | 7,340 | 4 | 0 |
| G. T. Perkins | 7,096 | 12 | 10 |
| Crockerell | 6,937 | 10 | 0 |
| Morley & Sons | 6,902 | 10 | 0 |
| Acme Flooring Co. | 6,864 | 0 | 0 |
| Smith & Co. | 6,673 | 4 | 8 |
| Gluyas | 6,354 | 0 | 0 |
| Bell & Sons | 6,181 | 0 | 0 |
| Ireland | 5,986 | 0 | 0 |
| Perkins & Sons | 5,950 | 0 | 0 |
| Chamberlain | 5,850 | 0 | 0 |
| Byard & Sons | 5,785 | 0 | 0 |
| Cooper & Co. | 5,714 | 10 | 6 |
| Watson | 5,700 | 0 | 0 |
| Macdonald | 5,647 | 0 | 0 |
| Deakin | 5,593 | 14 | 0 |
| Thatcher Bros. | 5,523 | 0 | 0 |
| Wood | 5,467 | 8 | 3 |
| Brebner & Co. | 5,442 | 0 | 0 |
| Ewart | 5,426 | 0 | 0 |
| Johnson Bros. | 5,422 | 0 | 0 |
| Mereweather & Sons | 5,299 | 0 | 0 |
| Steer & Pearce | 5,171 | 9 | 6 |
| Chick | 5,074 | 4 | 0 |
| LOVELL, Bristol (*accepted*) | 4,903 | 0 | 0 |
| Breece | 4,860 | 0 | 0 |

For the provision and erection of pumping machinery at the new sewage pumping station. Messrs. A. P. I. COTTERELL & CARR, engineers, Westminster and Bristol.

| | | | |
|---|---|---|---|
| HUNT, Bristol (*accepted*) | 524 | 0 | 0 |

## CREWE.

For the erection of a training college for teachers for the Cheshire education committee. Mr. H. Beswick, F.R.I.B.A., county architect, Chester.

| | | | |
|---|---|---|---|
| Davenport, Stockton Heath, Warrington (*accepted*) | £22,990 | 0 | 0 |

There were twenty-five tenders,

## ISLE OF WIGHT.

For erection of hospital at Fairlee, for the Isle of Wight Joint Hospital Board.

| | | | |
|---|---|---|---|
| Day | £8,877 | 0 | 0 |
| Rousell | 7,080 | 0 | 0 |
| Hayles & Son | 6,958 | 0 | 0 |
| Quinton | 6,928 | 0 | 0 |
| White | 6,866 | 0 | 0 |
| Linington | 6,825 | 0 | 0 |
| Westbrook | 6,720 | 0 | 0 |
| Ball & Son | 6,690 | 0 | 0 |
| Sims | 6,440 | 0 | 0 |
| Meader, Cowes (*accepted*) | 5,960 | 0 | 0 |
| Jenkins | 4,964 | 0 | 0 |

## LONDON.

For making up, &c., of Milton Road (eastern end), for the Hanwell Urban District Council. Mr. S. W. Barnes, surveyor, Council Offices, Hanwell, W.

| | | | |
|---|---|---|---|
| F. & C. Macklin | £1,013 | 18 | 5 |
| Watson | 1,007 | 1 | 6 |
| Free & Sons | 996 | 1 | 6 |
| Kavanagh & Co. | 991 | 1 | 6 |
| Clements, Knowling & Co., Brentford (*accepted*) | 887 | 0 | 0 |

For the making-up and paving of part of Crowborough Road, Streatham, for the Wandsworth Borough Council. Mr. P. Dodd, borough engineer.

| | | | |
|---|---|---|---|
| Dykes | £730 | 0 | 0 |
| Wall | 700 | 0 | 0 |
| Parry & Co. | 697 | 0 | 0 |
| Adams | 691 | 0 | 0 |
| Etheridge | 687 | 0 | 0 |
| Harringdon & Co. | 681 | 0 | 0 |
| Mowlem & Co. (*accepted*) | 669 | 0 | 0 |

## SOUTHWICK (SUSSEX).

For private street works in Cross Road, for the Urban District Council. Mr. G. W. Warr, surveyor.

| | | | |
|---|---|---|---|
| King | £1,304 | 14 | 0 |
| Parsons & Sons | 1,199 | 0 | 0 |
| Peerless, Dennis & Co., Eastbourne (*accepted*) | 1,168 | 0 | 0 |

## SPENNYMOOR.

For the erection of a higher elementary school for 810 pupils. Mr. W. Rushworth, Shirehall, Durham.

| | | | |
|---|---|---|---|
| Telfar (*accepted*) | £7,293 | 0 | 0 |

## TRURO.

For the erection of offices for the Cornwall County Council. Messrs. Silcock & Reay, architects, Bath.

| | | | |
|---|---|---|---|
| Nicholls Bros. | £17,948 | 10 | 3 |
| Hodge, Mitchell & Bond | 16,810 | 6 | 0 |
| Berryman | 16,700 | 0 | 0 |
| Willcock & Co. | 15,825 | 0 | 0 |
| Roberts | 15,351 | 0 | 0 |
| Lovatt | 15,232 | 0 | 0 |
| Wills & Sons | 15,130 | 0 | 0 |
| Long & Sons | 14,742 | 0 | 0 |
| Cole | 14,550 | 0 | 0 |
| Haywards & Wooston | 14,500 | 0 | 0 |
| Bennett | 14,488 | 11 | 0 |
| Shellabear & Sons | 14,340 | 0 | 0 |
| Crockerell | 14,229 | 14 | 3 |
| Colliver | 14,072 | 3 | 8 |
| Blake | 13,925 | 0 | 0 |
| Miners | 13,876 | 16 | 0 |
| Lapthorne & Co. | 13,870 | 0 | 0 |
| Colbourne | 13,570 | 7 | 9 |
| Wakeham Bros. | 13,415 | 0 | 0 |
| Pethick Bros. | 13,377 | 0 | 0 |
| Stanbury, Devonport (*accepted*) * | 12,799 | 0 | 0 |

* Accepted subject to the approval of the Local Government Board.

## WALES.

For additions to the County school, Llandovery, Carmarthenshire. Mr. W. Vincent Morgan, county architect, Carmarthen.

| | | | |
|---|---|---|---|
| T. & J. Brown | £3,150 | 0 | 0 |
| Davies & Sons | 3,106 | 0 | 0 |
| Thomas Bros. | 2,950 | 0 | 0 |
| Howell & Son | 2,946 | 0 | 0 |
| Groom | 2,870 | 0 | 0 |
| Mercer | 2,825 | 0 | 0 |
| R. Davies, Carmarthen (*accepted*) | 2,599 | 0 | 0 |

For the supply, delivery, and construction of the steelwork for a bridge over the river Corrwg at Glyncorrwg, for the Glyncorrwg Urban District Council.

| | | | |
|---|---|---|---|
| Forsdike | £705 | 0 | 0 |
| Finch & Co. | 638 | 0 | 0 |
| Gilbert, Thompson & Co. | 586 | 0 | 0 |
| Fraser | 579 | 0 | 0 |
| Dawnay & Sons | 563 | 0 | 0 |
| Lambourne & Co. | 556 | 0 | 0 |
| E. C. & J. Keay | 536 | 0 | 0 |
| Lewis & David, Port Talbot (*accepted*) | 524 | 0 | 0 |

For building cottage homes at Abercwmboi, for the Merthyr Board of Guardians.

| | | | |
|---|---|---|---|
| Davies & Son | £1,880 | 0 | 0 |
| W. & J. Watson | 1,659 | 0 | 0 |
| Hatherley & Co. | 1,597 | 0 | 0 |
| Willis | 1,590 | 0 | 0 |
| Morgan & Son | 1,548 | 0 | 0 |
| Jones Bros. | 1,478 | 0 | 0 |
| Rees, Trecynon (*accepted*) | 1,460 | 6 | 8 |
| Colborne | 1,429 | 14 | 4 |

For pulling down existing police buildings and erecting on the site a headquarters station at Pontypool. Mr. William Tanner, F.S.I., county surveyor.

| | | | |
|---|---|---|---|
| Leadbeter & Co. | £2,795 | 0 | 0 |
| Moon | 2,779 | 0 | 0 |
| Davies & Sons | 2,775 | 0 | 0 |
| Colborne | 2,689 | 8 | 9 |
| Campbell | 2,687 | 0 | 0 |
| Blundell & Bevan | 2,658 | 10 | 0 |
| Powell & Son | 2,650 | 0 | 0 |
| Jenkins | 2,650 | 0 | 0 |
| Bailey Bros. | 2,643 | 0 | 0 |
| A. & J. Richards | 2,549 | 0 | 0 |
| Leadbeter | 2,496 | 0 | 0 |
| Morgan & Co. | 2,495 | 0 | 0 |
| Brownscombe & Son | 2,490 | 0 | 0 |
| Burgoyne & Son | 2,483 | 10 | 0 |
| Williams | 2,459 | 0 | 0 |
| Sainsbury | 2,442 | 0 | 0 |
| Reed | 2,440 | 0 | 0 |
| Poulton & Whiting, Pontnewydd (*accepted*) | 2,406 | 0 | 0 |

For erection of the tower, chancel, and vestries at Christ Church, Radyr, near Cardiff. Mr. George E. Halliday, F.R.I.B.A., architect, Cardiff.

| | | | |
|---|---|---|---|
| Harry | £2,935 | 18 | 0 |
| Barnsley & Sons | 2,854 | 0 | 0 |
| Stephens, Bastow & Co. | 2,596 | 0 | 0 |
| Symonds & Sons | 2,562 | 0 | 0 |
| Blacker Bros. | 2,530 | 0 | 0 |
| Allen | 2,515 | 0 | 0 |
| Smith | 2,505 | 10 | 0 |
| Cox & Bardo | 2,481 | 0 | 0 |
| Hallet | 2,444 | 13 | 3 |
| D. Davies & Sons | 2,430 | 0 | 0 |
| Knox & Wells | 2,415 | 0 | 0 |
| Britton | 2,347 | 9 | 6 |
| Evans | 2,316 | 11 | 0 |
| D. Davies | 2,241 | 10 | 0 |
| Turner & Sons, Cardiff (*accepted*) | 2,353 | 0 | 0 |

## WEST HAM.

For making up Knights Road (part of), Silvertown, for the Borough Council.

| | | | |
|---|---|---|---|
| Acme Flooring and Paving Co. | £763 | 0 | 0 |
| Jerram | 681 | 15 | 9 |
| Improved Wood Pavement Co. | 666 | 3 | 7 |
| Harris | 645 | 0 | 0 |
| Adams | 625 | 9 | 2 |
| Anderson | 572 | 9 | 9 |
| Griffiths & Co., Bishopsgate Street (*accepted*) | 554 | 4 | 4 |

### WOKING.

For the surface-water drainage of Horsell and a small part of Woking.

| | | | |
|---|---|---|---|
| Pedrette | £3,910 | 14 | 8 |
| Kavanagh & Co. | 3,794 | 8 | 9 |
| Nunn & Co. | 3,554 | 9 | 6 |
| Douglas | 3,445 | 0 | 0 |
| Acme Flooring Co. | 3,425 | 9 | 7 |
| Wickstead | 3,422 | 16 | 0 |
| Swaker | 3,382 | 5 | 8 |
| Streeter & Co. | 3,235 | 10 | 7 |
| Willis & Powis | 3,230 | 6 | 5 |
| Bell | 3,109 | 7 | 8 |
| Muirhead | 3,063 | 8 | 1 |
| Brebner & Co. | 3,050 | 10 | 6 |
| Franks | 3,001 | 2 | 7 |
| Wheeler | 2,969 | 3 | 9 |
| Moss & Sons | 2,920 | 14 | 0 |
| Wood & Son | 2,906 | 4 | 6 |
| May | 2,898 | 4 | 2 |
| Watson | 2,896 | 17 | 8 |
| HARDY & Co., Woking (*accepted*) | 2,471 | 8 | 0 |

### TRADE NOTES.

DR. W. P. KLOBUKOWSKI, engineer chemist, of Warsaw, has patented in this and fourteen other countries a fuel economiser or heat increaser for use in connection with English fireplaces, which is well known in Russia and Poland. The invention is along lines that have been successfully attempted in the past, but in its latest form contains many valuable alterations to the original types. All round the base of the grate runs a trough containing a small quantity of water. On each side is an air inlet on the floor level, which conducts the cold air from the room into the hollow space or air chamber at the back of and around the grate, where it becomes heated, and returns into the room through an outlet or outlets at the mantlepiece level. The interior of the grate is made in three grooved horizontal pieces with concave surfaces so as to allow of expansion and contraction. In the previous fireplaces the fire interiors were made in one straight piece, with the result that the iron quickly cracked. The water trough is another important improvement, for it keeps the air continually moist and sweet instead of as before being discharged into the room dry and unpleasant. The draught is regulated by a canopy. The patent is, we understand, shortly to be placed upon the English market.

MESSRS. SETZER & Co. have removed their Manchester offices to 2 Mosley Street. Their telephone number is 3045 City.

### THE STATUS PRIZE.

THE above will be awarded by the Society of Engineers each year for the next four years ending 1913 (if papers of sufficient merit are received) for the best paper written on "How to Improve the Status of Engineers and Engineering, with special reference to Consulting Engineers." The prize will consist of books and/or instruments of the value of three guineas, selected by the author of the premiated essay. The essay shall be written in the third person, and shall contain not fewer than 4,000 nor more than 6,000 words. All essays submitted and the copyright therein shall become the property of the Society, but the donor also shall have the right of publishing them. The Council of the Society may, at their discretion, permit the publication of any essay by its author. The premiated essay shall be read and discussed at a meeting of the Society, and it will be published in the Society's journal. Essays must be received by the Secretary on or before May 31 in each year.

AT a meeting held in the Mayor's Chamber, Guildhall, Newcastle-on-Tyne, last week, it was resolved to form an association to be called the North-East Association of Paint and Oil Manufacturers and Wholesale Merchants.

MESSRS. FOWLER & MARSHALL, surveyors for the Laughton sewage scheme, have submitted to the Rotherham Rural Council fresh plans and estimates, a considerable reduction having been made. The Council decided to forward the plans and estimates to the Local Government Board, and to ask for sanction to borrow the necessary amount over 8,000*l.*

### VARIETIES.

COUNT PLUNKETT, Hon. A.R.I.B.A., lectured last week on "Thomas Frye, the Irish Artist," for the Architectural Association of Ireland.

MR. DANIEL GRIEVE, of Washington Lane, Edinburgh, joiner and builder, who died on August 28, left personal estate valued at 11,568*l.*

THE Ayr Town Council have agreed that it is desirable to erect a pavilion for the use of the public in the town, and a scheme is to be submitted as soon as possible.

THE Association of Master Painters in Ireland held their eleventh annual convention on the 12th inst. in Cork, when Mr. John O'Connell, of Cork, was installed as president.

THE Liverpool finance committee have agreed to the recommendation of the baths committee that an amount for the provision of plant for a supply of sea water to the public baths be included in the estimates for 1910.

ARRANGEMENTS have been made with a firm of manufacturers in Leicester to open a glove factory in Dalbeattie, N.B. A site has been obtained, and on it a building to accommodate fully 200 workers will be erected by a local syndicate.

THE plans prepared by Messrs. Frederick Clark & W. J. Moscrop, architects, Darlington, for a proposed technical and secondary school at Workington, and which were placed first in competition, have been accepted by the Cumberland education committee.

A CONTINENTAL engineering firm have, it is stated, practically completed arrangements for securing a site of fifteen acres at Darlington, on which large workshops will be erected, in consequence of the expectation of tariff reform.

THE Glasgow Dean of Guild Court on the 13th inst. granted the following linings:—The National Telephone Co., Ltd., to erect a building at the corner of Hope Street and Renfrew Street; Govan School Board, to erect a public school at Craigton; Messrs. Watson, Laidlaw & Co., Ltd., 98 Dundas Street, South, to erect an erecting shop in Kinning Park.

AN English company has undertaken the construction and equipment of a market hall at Saratoff, Russia, at a cost of 400,000 roubles (about 42,000*l.*). The hall is to be a lofty building with a full glass roof and one-storeyed shops, the latter fitted with water supply, &c., and cold storage premises beneath the shops.

THE Lancashire and Yorkshire Railway Company have agreed to purchase St. Paul's Church and churchyard, Liverpool, at a cost of 15,000*l.*, for extending the Exchange Station. The church was erected a century and a half ago, and has been closed for the past few years. A number of other properties have also been bought. A Bill to sanction these purchases is to be promoted in Parliament next session.

THE Local Government Board has sanctioned the application of the Llandrindod Wells Urban District Council for a loan of 6,000*l.* for the purchase of Brynarlias and grounds, the home of the late Dr. Bowen-Davies, for the purpose of its adaptation for municipal buildings, offices, fire-brigade station, stables, &c. It is proposed to retain a part of the land for a market hall and free library.

AT the last meeting of the Gainsborough Urban Council a letter was read from the Local Government Board, in reply to the Council's application to erect shops on the surplus land left from the Church Street improvement, stating that they knew of no statutory authority which would enable the Council to build shops. They had, however, no objection, and recommended the Council to pass a resolution and make application to them under Section 175 of the Public Health Act, 1875, for a direction empowering the Council to retain the land. The Council decided to adopt this course.

THE Scarborough Cliff Bridge (Spa) Company have shelved the proposed scheme for the improvement of the Spa at a cost of about 8,000*l.* The main feature was the removal of the present bandstand and the erection of a larger one, and the construction of a combined covered-in and open-air café, with a promenade between the grand hall and the tower. Out of ten sets of plans for the work, the committee selected those of Messrs. Russell & Cooper, London. They have also consulted Mr. James Walker, engineer to the Tyne Improvement Commissioners, as to the proposed widening of the promenade. The scheme will come up for further consideration at the next annual meeting.

A LOCAL Government Board inquiry was held on the 6th inst. into an application by the Scarborough Town Council to borrow 3,000*l.* for the construction of a pavilion in the Alexandra Gardens. Mr. H. W. Smith, the borough engineer, said the building would be 140 feet by 50 feet, with one bay 50 feet by 7½ feet, and two bays 30 feet by 15 feet, the stage and dressing-rooms being 50 feet by 20 feet. The front would be of folded glass screens, which would enable the whole of the front to be entirely or partially thrown open. There was very keen opposition on behalf of the ratepayers generally to this proposal.

Mr. J. Henry Taylor, borough surveyor of Barnsley, has just issued his annual statement as to the number and description of new buildings for which plans had been submitted to the Town Council, and of the number and description of the buildings which had been erected during 1909. The total number of sets of plans submitted was 124, of which 114 were approved, and 10 disapproved. This number included 286 villas, houses, and cottages; 12 shops; four public buildings, including schools; and 11 buildings of other descriptions, including alterations and additions. Last year the sets of plans deposited numbered 107; in 1907 the number was 117, and in 1906 93. The number of buildings erected and certified as ready for occupation during the year was 289.

The Glasgow Corporation committee, reporting on the annual competition by children in Glasgow and district schools of drawing specimens in the Glasgow Museum, direct the attention of teachers and competitors to the following suggestions for further improving the character and quality of the work sent in:—(1) More examples in colour might with advantage be done; (2) in the representation of vases, whether plain or ornamental, the light and shade due to the cylindrical form of the object must be expressed. In many instances the contours of vases were drawn and the ornament copied just as though the surface were flat, like a wall paper; (3) all "tricky" or mannered technique should be discouraged. The essentials of good work are accurate and searching observation of form, light, and shade, or colour, to be expressed by careful and intelligent workmanship in whatever medium may be selected.

The removal of works and factories from highly rated and congested districts to more suitable places is now frequent. Amongst the principal factors determining these migrations are the provisions of the new patent law; the labour question and rate of wages; and contiguity to ports, coal and iron fields, and centres of population. The vital question of economy of output is materially affected by the choice of locality, and it is claimed that nowhere can these advantages be better secured than in the districts served by the Great Western Railway. Full information on the finest sites procurable around London, the West of England, the Midlands, and Wales will be supplied by Mr. T. H. Rendell, chief goods manager, Paddington Station, W.

The central portion of the early sixteenth-century chancel screen of St. Buryan Church, Cornwall, the finest in the county, which has been undergoing restoration, has been completed and refixed in the church, the work being carried out by Rashleigh Pinwill, of Plymouth. Upon the portions of the cornice which remain is a vine pattern, amongst the branches of which is a flight of doves, hunting scenes, fighting animals, birds, and grotesques. Only the lower portion of screen remained, the panels of which appear to be a conventional treatment of seaweed and sunflower. Some beautiful colouring remains on some of the old portions.

Sir Alexander R. Binnie, M.Inst.C.E., &c., has been engaged by the Manchester City Council to examine and report upon the city surveyor's scheme for extending the main drainage of the city. The question of the inadequacy of the existing intercepting sewers of the city has been before the rivers committee for some years, and the insufficiency of the sewers was shown in an alarming manner during the storms of the past year. The present sewers were designed in 1886-7, since when the population has increased from 376,895 to 743,707, and the drainage area from 5,934 acres to 23,420 acres. The committee instructed the city surveyor to submit a complete scheme which would provide not only for the existing city, but for the districts which might probably be added during the next fifty years. The scheme has been prepared, and will take from ten to fifteen years to carry out. The estimated cost is 850,000*l.*

The following particulars of a new process for the manufacture of white lead are from the report by the British Vice-Consul at Detroit (Mr. H. G. Meredith) on the trade of that district in 1908:—The time taken from the entrance of the pig lead into the smelter on the top floor to its reappearance as a finished product at the bottom is six days. After passing from the melting furnace, the lead is sent to a tank on the floor below where it is crushed into a soft blue gritless mass. Thence it goes down into tanks where further agitation with water and steam transforms the mass into a yellow compound of glowing fineness. The product is then sent to another floor, where by a series of rotating cylinders it is treated with carbon-dioxide gas and bleached. From these cylinders, after thirty-six hours' constant agitation, the product is sent to the precipitating tables, where it is washed, the unfinished particles (if any) being sent to the cistern with all refuse water, which is pumped to the top and used over again, every part of the raw material being thus utilised. The moving of the product is done entirely by the force of gravity. From the precipitating table the lead, now a spotless white, is taken to the drying beds—immense shallow pans of white canvas. Not more than six men are required to work the plant, which turns out 6,000 tons of white lead a week.

## THE WARMING AND VENTILATION OF PUBLIC BUILDINGS AND FACTORIES.*

*(Continued from last week.)*

By T. W. Aldwinckle, F.R.I.B.A.

The warming and ventilating of churches and chapels are seldom satisfactory, particularly churches with a lofty nave and clerestory windows. Cold draughts are usually much complained of. This is caused by the very large cooling surface of the walls and windows as well as the open roof. It is a good plan, whatever the warming apparatus may be, to keep it going constantly throughout the winter. If allowed to go down when the building is not in use the walls soon become cold, and the warming process has to be gone over again. Means should be provided for warming the air at the upper part of the building.

We may safely assume that natural ventilation is unsuitable and non-effective in most cases where a considerable number of persons are congregated together in a hall, room, or factory, with a less cubic space per head than 300 feet. This is because it is impossible to put into the room the requisite amount of fresh air, without creating unpleasant draughts, and without lowering the temperature of the room during the winter to a point below that which is requisite for health and comfort.

In dealing with the records of any tests of natural ventilation taken during the winter months, it is advisable to take careful note of the internal temperature of the room. It is a very easy matter to throw open the windows and flood the room with cold air, and thus to produce a low proportion of $CO_2$, but the problem of ventilation is not thereby satisfied. A suitable temperature must also be provided, and this is often a matter of considerable difficulty, and one which is sometimes wholly ignored.

Mechanical ventilation can be conveniently divided into three classes, viz.:—Exhaust ventilation, plenum ventilation, plenum and exhaust ventilation, with a variant upon all three as "upward" or "downward."

Mechanical ventilation is suitable for, and in some cases only adaptable, for the following buildings:—Theatres and concert halls, courts of justice, town halls, council rooms, waiting halls for outdoor patients, crowded factories and workshops, operating theatres, laboratories.

To render any system of mechanical ventilation economical, effective and also comfortable to those who must pass a good deal of their time in it, we should provide large duct areas and low velocities in delivering or exhausting the air, and large heating surfaces and low temperatures in the warming parts of the system. I do not myself consider that air for warming purposes should ever be passed over or through heating surfaces having a higher temperature than 150° Fahr., for the reasons which will be hereafter given.

Exhaust ventilation has usually the advantage of being simpler and more economical in construction than the plenum system, and more easy of adaptation to existing buildings, and it is free mostly from the necessity of long air inlet ducts. With suitable and efficient means of extraction provided, a definite quantity of the vitiated or used air is removed per hour, this operation drawing in a corresponding quantity of external air to take the place of that which is removed. In the old days, and indeed until about twenty-five years ago, the air was extracted by means of vertical shafts, in which an upward current was induced by heating the air to a temperature considerably higher than the external air.

This system of producing an upward current was very

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* A paper read before the Association of Engineers in-Charge on January 12.

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costly, and has been entirely superseded by the use of fans, which, if driven at a moderate speed, are very economical to run. The current of air induced by a heated shaft is at best rather a feeble one, and varies with the temperature of the external air, being the least effective when it is most required, viz., when the external air is warm and close.

Exhaust ventilation is generally of an upward character, the extraction being in the ceiling or roof, and the inlets near the floor or near the breathing line. The arrangement of the extraction is generally a simple matter, if care is taken to provide fans of suitable capacity. Where the resistances are small and the extraction ducts (if any) are short, propeller fans can be used, but where the resistances are high, the ducts long and numerous, and the quantity of air to be removed is large, centrifugal fans are necessary. Generally speaking it may be stated that propeller fans should not be used for a resistance of over ¼ inch of water, as the quantity of air passed will be small against a high resistance. In this connection it should be borne in mind that the work done by an extracting fan consists not only in removing the vitiated air, but also in bringing in the fresh air through the authorised inlets, and that these inlets offer, in many cases, considerable resistance.

When the quantity of air to be removed is large, and coming possibly from several rooms into one extraction shaft, the direction, shape, and size of the extraction ducts require great care and consideration, with a view to reducing the resistance, and to secure that each inlet into the duct shall carry its due proportion of air. It is very important that all inlets into the main trunk should be well curved in the direction of the air current in the duct, and that the duct should be tapered or otherwise enlarged so as to be able to carry the increased volume of air brought in by successive inlets without altering the general velocity. It should also be borne in mind that very high velocities should be avoided, as not only does this increase the resistance due to friction in the ducts, but the horse-power necessary to drive the fan increases as the cube of its speed. Thus, if a fan is running at 400 revolutions per minute, and drawing 4,000 cubic feet per minute through the duct, and taking two horse-power, doubling the speed of the fan in order to draw double the quantity of air through the same duct will require sixteen horse-power, to say nothing of the increased friction in the duct. This means that it is more economical in horse-power, and consequent annual cost, to arrange good-sized ducts, with the air travelling at a moderate velocity. It is also important to have plenty of access doors to the ducts for cleaning purposes.

The extracting arrangements being complete, let us now consider the inlets. The position of these will vary according to the requirements of the hall or room, but it is essential that the external air shall enter as direct as possible from the outside, not near the ground level, and far from any source of air pollution. In a simple system of extraction ventilation there will generally be openings in the external walls, with gratings and channels through the walls, close, if possible, to the floor level. All these inlets should be regulated by dampers, as with a strong wind blowing upon the inlets a large influx of air would be uncomfortable. The net area of the inlets should be such as will admit the necessary quantity of air at a velocity of not more than 3 feet per second. The channels through the walls should be lined with glazed bricks, and means of access should be provided for cleaning purposes. Then the incoming air has to be warmed during the winter. This requires that a radiator should be placed in front of the inlet, with baffles so arranged that the incoming air impinges well upon the surface of the radiator before entering the room. This is preferable to enclosing the radiators in cast-iron cases, as these harbour dirt inside.

The inlets just described we term "authorised" inlets. The suction power of the fan will, however, to some extent be felt all over the hall or room, and a certain amount of external air, not by any means a small quantity, will be drawn in from any point through which the air can enter, such as through external walls, chinks in windows, and the like. These are called "unauthorised" inlets, and must be reckoned with. Care must in the first place be taken that air is not drawn in from any polluted sources. The risk of this is one of the disadvantages of the "exhaust" system. Also in calculating the heating surface for the general warming of the rooms, allowance must be made for the air which will come in through these "unauthorised" inlets. This air will be cold, and will require warming, and this is another drawback to the exhaust system from which the plenum system is free. This inleakage of air through walls, especially in cold weather, is considerable even with natural ventilation, but it is much greater when there is a partial vacuum in the room caused by the exhaust fan.

We must always bear in mind that to render a system of exhaust ventilation complete and efficient, at all events in the winter, the windows must be kept closed, and the air supply obtained from the authorised inlets. It will be obvious that if the extracting fan is efficient the external air will be sucked in at the point of least resistance. If a window 3 feet wide is open, say, to a height of 3 feet, that would be an inlet area of 9 feet, which would be, at least, three times larger than the net area of any authorised inlet, and that the external air will consequently enter through the window and not through the inlet. This can be verified by any one who wisely possesses a Tobin's tube in his own dining-room. In the winter, with a fire going, the air will enter through this tube at a velocity of about 2 or 3 feet per second, but if a window is opened the inlet entirely ceases to act.

The exhaust system is suitable for town halls, council rooms, large city offices and banks, schoolrooms, and under some conditions for factories and workshops.

The primary advantage of plenum ventilation is that it puts into the hall or room a specific and measurable quantity of fresh air, in specific positions, at definite and ascertained velocities, and at definite temperatures, and that this air can be filtered, moistened, and warmed at the main air inlet. No other system admits of these advantages. The exits of air can be arranged at "authorised" outlets, which should be carefully protected against wind influence, but a portion of the air can also escape, and is always pretty sure to do so, through some "unauthorised" outlets. In this case, however, no harm can accrue from any pollution or from any lowering of the temperature of the room.

The main drawbacks to the plenum system are (*a*) that as a rule, long ducts are necessary for the distribution of the air, and (*b*) that as the air has to travel a considerable distance along these ducts, the initial temperature as it leaves the heating battery is generally arranged somewhat high, in order to compensate for the cooling in the ducts. These heating batteries are generally heated with steam from 10 lbs. to 40 lbs. pressure, or at temperatures from 240° Fahr. to 285° Fahr. This causes a baking or drying of the air, and as in our climate we are accustomed to air with a fairly high degree of humidity, the artificial drying of the air causes unpleasant sensations. We constantly hear complaints on this score from those in this country who pass a considerable portion of their time in halls or rooms under plenum systems. One hears of no such complaints in America or Germany, because they are accustomed to a dryer atmosphere. I am strongly of opinion that we can remedy these defects and render plenum ventilation more acceptable, because more comfortable to us, by working upon somewhat different lines in the manner I shall hereafter describe, in connection with a building which I have recently warmed and ventilated upon the plenum system for the Metropolitan Asylums Board.

It is when plenum is coupled with auxiliary exhaust that I consider it most effective. The outlets can be better regulated, and the intended direction of the air currents better ensured. The word "plenum" suggests that the air of the rooms is under a mild kind of pressure, ensuring its equal distribution (assisted by the law of the diffusion of gases) throughout the room, and this is the primary object of all effective ventilation. Care must be taken to avoid short-circuiting of the air, either by having the exhaust too powerful, or by having the outlets placed too near to the inlets. It is desirable for this reason that the power of the plenum fan shall always be in excess of the exhaust. There is no fear of the air not getting out, it will always find a way when necessary.

It is essential that the fresh air should be brought in from a pure and uncontaminated source, and at some height above the ground level, particularly in large towns, and the inlet should be well protected against wind and rain. It is preferable, if possible, to have the air intake on the southern or warmer side of the building. The incoming air generally requires some kind of filtration, if only to remove the particles of dust. It is very important that this filter should be either self-cleansing or easily cleansed. There should also be a good water spray to prevent drying of the air. I have used a filtering screen consisting of a large number of galvanised steel rods placed to break joint about ¼ inch apart, all being removable. A water trough is placed above these, from which water trickles down the rods.

For the purpose of driving the air through the duct a centrifugal fan is almost necessary, a propeller fan being not equal to overcome the resistance. The fan should, for the reasons already given, be driven at only a moderate speed, and should have a fair reserve of power, so that there may be no question as to the amount of air supplied. An electric motor is the best kind of power to drive the fan, and there should be means of speed regulation.

The heating battery through which the air is driven for warming purposes should not, in my opinion, have a higher temperature than 150° Fahr. In order to prevent undue loss of temperature in the main ducts, these latter should have hot water pipes placed in them.

In theory the effectiveness of heating surfaces in thermal units increases with the velocity of the air passing over such surfaces, but there is a limit to this, and it is found in practice that air moving at a very high velocity does not give proportionally high temperatures, as a larger volume of air is passed, and the time of contact is decreased. It was found by experiment that air passed through a battery of 75 lbs. steam at a velocity of 27 feet per second gave a much lower temperature than at a velocity of 15 feet per second.

In order to secure adequate control over the resulting temperature in the rooms, the battery should be so constructed that parts of the heating surface can be shut off by valves. This will enable the room temperature to be regulated to meet the varying temperatures of the external air.

(*To be continued.*)

## THE BUILDING TRADE IN QUEENSLAND.

NEVER perhaps in the history of Queensland has its solidity been better exemplified by the condition of the labour market and the activity of the building trade than at present. Notwithstanding that building material is selling at rates considerably higher than a few years ago, and when timber particularly is at a figure which but a short time since would have been regarded as prohibitive, new buildings and extensions, plans and proposals, are the order of the day. On every hand there are the signs of solid progress. In view of the emigration of bricklayers and stonemasons from this country to Queensland, it is of interest and importance to note that the Minister of Works has given his approval to the following award which has been made by the Wages Board, and which was to come into operation on January 1, 1910.

### *Bricklayers' Trade.*

*Hours.*—The ordinary working hours shall not exceed forty-four in any one week, and shall be confined between the hours of 8 A.M. and 5 P.M. on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays, and between the hours of 8 A.M. and 12 noon on Saturdays, provided that during such ordinary working hours one shall be allowed for a meal on such days, except Saturdays.

*Wages.*—The lowest wages, price, or rate payable to bricklayers shall be 1*s.* 6*d.* per hour, or 3*l.* 6*s.* per week of forty-four ordinary working hours; provided however that when bricklayers are engaged in preparing the brickwork of furnaces and settings in connection with boilers, bakers' ovens, or furnace work of any description they shall be paid not less than at the rate of one and a quarter time the rate therein set forth.

*Apprentices and Improvers.*—The number, or proportionate number of apprentices or improvers who may be employed shall not exceed one apprentice or improver to five, or any fraction of five, bricklayers who are in receipt of not less than the minimum rate set forth in clause 2 hereof. Provided, however, that one apprentice or improver may be employed by any employer. The lowest wages, price, or rate payable to apprentices or improvers shall be 7*s.* 6*d.* per week for the first year, 12*s.* 6*d.* per week for the second year, 20*s.* per week for the third year, 25*s.* per week for the fourth year, and 35*s.* per week for the fifth year. Thereafter, not less than the minimum rate.

*Overtime.*—All time worked in excess of the ordinary weekly working hours before 8 A.M. shall be paid for as follows:—For the first two hours not less than at the rate of one and a quarter time the minimum rate set forth in clause 2 hereof, and for subsequent hours, not less than at the rate of one and a half time such minimum rate.

*Holidays.*—All time worked on any Sunday, Christmas Day, Good Friday, or eight-hour day, shall be paid for at not less than the rate of double the minimum rate set forth in clause 2 hereof. All time worked on any New Year's Day or Sovereign's birthday shall be paid for at not less than the rate of one and a quarter time the minimum rate set forth in clause 2 hereof.

### *Stonemasons' trade.*

The determination for stonemasons contains the following provisions:—For the purpose of the determination the following definitions shall apply:—"Building mason" shall mean a stonemason who has been working not less than four years at his craft in connection with building construction and who is over twenty-one years of age. "Monumental mason" shall mean a stonemason who is engaged in preparing or fixing all stone for cemetery purposes or in preparing marble or cutting inscriptions for cemetery purposes or in preparing marble or cutting inscriptions for cemetery or other work. "Porphyry mason" shall mean a stonemason who is engaged in preparing or fixing porphyry stone for all purposes.

*Hours.*—Same as bricklayers' trade hours.

*Wages.*—The minimum rate of wages shall be as follows:—Building masons 1*s.* 4½*d.* per hour, monumental masons 1*s.* 4*d.* per hour, porphyry masons, 1*s.* 4½*d.* per hour.

There are also special provisions for apprentices and improvers, overtime, and travelling allowances, which would take up too much space to give in detail.

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## THE INSTITUTION OF MUNICIPAL ENGINEERS.

AT the last meeting of the Council of the above Institution held at 39 Victoria Street, London, S.W., thirty-seven applicants were elected to membership, and five to studentship. The roll of the Institution now stands at 679 members and ninety-six students, making a total of 775.

The Secretary was instructed to send to the National Association of Local Government Officers a copy of the following resolution which was passed at a meeting of the Northern District of the Institution, held on December 18:—"That the Council of the Institution be asked to communicate with the N.A.L.G.O., asking them to send a letter to each candidate for Parliament at the forthcoming election, inquiring whether he is prepared to vote for a Bill giving to local government officers superannuation on similar lines to that now enjoyed by poor law officers."

It was decided that arrangements be made to hold the next general meeting of the Institution, if possible, in Manchester in February.

It was decided that any member of the Institution be allowed to attend Council meetings, and that any member so attending may, with the permission of the acting chairman, address the Council on any matter under consideration.

It was resolved that the suggestions made at the joint meeting of the Council and hon. district secretaries on November 27, together with the observations since received on these suggestions, be referred to a committee.

It was resolved that a committee to be known as the revision of by-laws committee be appointed to prepare new draft by-laws.

It was resolved in pursuance of the resolution carried at the last general meeting, "That a committee to be known as the examination committee be appointed."

THE

# Architect and Contract Reporter.

FRIDAY, JANUARY 28, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2* P.M. *on Thursdays.*

## COMPETITIONS OPEN.

BLYTH.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

IRELAND.—Jan. 31.—The Pembroke Urban District Council, Co. Dublin, invite schemes and estimates for laying out Herbert Park (35 acres). Mr. J. C. Manly, Clerk, Town Hall, Pembroke, Co. Dublin.

LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

LONDON.—Feb. 8.—The committee of the Architectural Association Play 1910 invite designs for a poster illustrating this year's play. Prize 1*l.* 1*s.* Mr. Percy Lovell, 23 Old Queen Street, S.W.

MARCH 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l.* Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s.* Apply before Feb. 10 to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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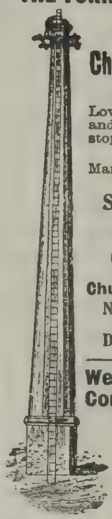

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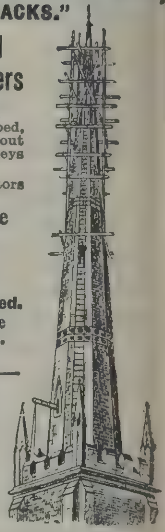

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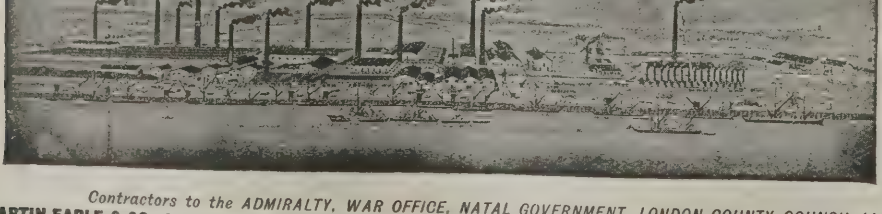

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**MARTIN EARLE & CO.**, Ltd., brand of **CEMENT** is extensively used in the construction of the following Works: **NILE RESERVOIRS, KEYHAM DOCKYARDS EXTENSIONS (30,000 tons), MERSEY DOCKS, DOVER HARBOUR, MANCHESTER CORPORATION WORKS, CLYDE NAVIGATION EXTENSIONS, HASTINGS HARBOUR, LONDON, BRIGHTON & SOUTH COAST RAILWAY DOCKS, LEITH DOCKS.** and in all the principal Colonial and import Markets. Estimates for large or small quantities on application to the **LONDON OFFICE, 139 QUEEN VICTORIA STREET.**

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1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, County Hall, Wakefield.

TORQUAY.—Feb. 10.—For erection of a post office for H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

TYNEMOUTH.—Feb. 9.—For execution of alterations at the workhouse. Deposit 1*l.* 1*s.* Mr. H. Gibson, architect, 56 Camden Street, North Shields.

WALES.—For erecting fifty houses at Ystalyfera. Mr. Charles T. Ruthen, architect, Swansea.

WALES.—Jan 29.—For erection of a detached house in Salisbury Road, Maesteg, for Dr. W. Kirkby. Deposit 2*l.* 2*s.* Send names by Jan. 29 to Mr. E. Whitfield Burnett, M.S.A., architect, St. Michael's Road, Maesteg.

WALES.—Feb. 3.—For erection of a parish hall at Bargoed. Mr. George Kenshole, M.S.A., Station Road, Bargoed.

WALES.—Feb. 8.—For erection of a workmen's institute at Cross Keys (Mon.). Deposit 2*l.* 2*s.* Mr. R. L. Roberts, M.S.A., Abercarn.

WALES.—Feb. 7.—For the proposed riding school and stabling to be erected on the Barracks Field, Cardiff. Deposit 1*l.* 1*s.* Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

YARM.—Feb. 2.—For alterations and improvements at the Yarm Council School, for the North Riding of Yorkshire County Council. Apply to the master or caretaker, Council School, Yarm, Yorks.

## TENDERS.

### BASINGSTOKE.

For alterations and additions to The Shrubbery, Clidesden Road. Mr. W. ROLAND HOWELL, architect, Reading, and 18 Percy Street, W.

| | | | |
|---|---|---|---|
| Margretts & Son | £2,365 | 0 | 0 |
| Collier & Catley | 2,299 | 0 | 0 |
| Goodall & Son | 2,260 | 0 | 0 |
| Mussellwhite & Sapp | 2,259 | 0 | 0 |
| Lewis & Bros. | 2,240 | 0 | 0 |
| HARRIS, Basingstoke (*accepted*) | 2,227 | 0 | 0 |

### BEVERLEY.

For redrainage, &c., East Riding County Lunatic Asylum, Beverley. Messrs. EVERARD, SON & PICK, civil engineers, architects and surveyors, Leicester.

| | | | |
|---|---|---|---|
| Brumby, Robinson & Son | £12,967 | 5 | 10 |
| Southern | 12,195 | 0 | 0 |
| Sangwin | 11,891 | 0 | 0 |
| Curtis | 11,500 | 0 | 0 |
| Robinson | 10,917 | 19 | 4 |
| Schofield & Son | 10,600 | 0 | 0 |
| Graham & Co. | 10,556 | 16 | 1 |
| Morley & Sons | 10,488 | 6 | 7 |
| Dews & Co. | 9,999 | 0 | 0 |
| H. Braithwaite & Co. | 9,621 | 0 | 0 |
| A. Braithwaite & Co. | 9,473 | 14 | 2 |
| Kettlewell | 9,380 | 0 | 0 |
| Moss & SONS, Loughborough (*accepted*) | 9,250 | 0 | 0 |

### BINGLEY.

For extension of shed at Argyll Mills, Bingley, Yorks. Messrs. THOMAS BARKER & SON, architects, London and Bradford.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Brown & Son, mason, bricklayer and excavator | £757 | 10 | 0 |
| Yorkshire Hennebique Contracting Co., reinforced concrete floor | 287 | 10 | 0 |
| Habson, joiner | 245 | 0 | 0 |
| Thornton, slater | 115 | 10 | 0 |
| Mellowes & Co., patent glazing | 100 | 11 | 0 |
| Rushworth, plumber | 69 | 0 | 0 |
| Spurr & Sons, plasterer | 45 | 11 | 7 |
| Bagnall & Son, painter | 38 | 14 | 4 |

### BOURNEMOUTH.

For West Undercliff Promenade. Mr. F. W. LACEY, M.Inst.C.E., F.R.I.B.A., borough engineer.

| | | | |
|---|---|---|---|
| Pedrette & Co. | £13,373 | 17 | 3 |
| Facey & Son | 8,036 | 15 | 7 |
| Moran & Son | 7,471 | 17 | 7 |
| Bell & Son | 7,451 | 9 | 1 |
| Grounds & Newton | 6,885 | 0 | 0 |
| Harrison & Co. | 6,792 | 0 | 0 |
| Wimpey & Co. | 6,734 | 17 | 0 |
| Goddard, Massey, & Warner | 6,335 | 14 | 8 |
| WILKINSON & Co., Bournemouth (*accepted*) | 6,056 | 0 | 0 |

### BOURNEMOUTH—*continued.*

For Winton Council schools. Mr. F. W. LACEY, M.Inst.C.E., F.R.I.B.A., borough engineer.

| | | | |
|---|---|---|---|
| McWilliam & Son | £16,254 | 0 | 0 |
| J. & H. Hayward | 16,211 | 0 | 0 |
| Hoare & Sons | 16,085 | 0 | 0 |
| Bowman & Sons | 15,994 | 0 | 0 |
| Jenkins & Sons | 15,947 | 0 | 0 |
| Jones & Seward | 15,936 | 0 | 0 |
| Wakeham Bros. | 15,641 | 0 | 0 |
| Goddard & Sons | 15,559 | 0 | 0 |
| Privett | 15,227 | 0 | 0 |
| Nicholson & Son | 14,130 | 0 | 0 |
| J. & M. PATRICK, Wandsworth, S.W., (*accepted*) | 13,930 | 0 | 0 |

For science, art, and technical schools. Mr. F. W. LACEY, M.Inst.C.E., F.R.I.B.A., borough engineer.

| | | | |
|---|---|---|---|
| McWilliam & Sons | £22,478 | 10 | 0 |
| Stephens, Bastow & Co. | 22,376 | 0 | 0 |
| Hoare & Sons | 21,969 | 0 | 0 |
| Goddard & Sons | 21,590 | 0 | 0 |
| Bowman & Sons | 20,945 | 0 | 0 |
| Smith & Sons | 20,550 | 0 | 0 |
| E. & A. Springings | 20,400 | 0 | 0 |
| Nicholson & Son | 20,341 | 0 | 0 |
| Privett | 20,212 | 0 | 0 |
| Johnson & Co. | 19,957 | 0 | 0 |
| Pattison & Sons | 19,714 | 0 | 0 |
| Jenkins & Sons | 19,523 | 0 | 0 |
| Wakeham Bros. | 19,288 | 0 | 0 |
| Jones & Seward | 19,270 | 0 | 0 |
| J. & M. PATRICK, Wandsworth, S.W. (*accepted*) | 19,055 | 0 | 0 |

### HAILEYBURY.

For erection of a house on the Haileybury College estate. Mr. JOHN W. SIMPSON and Mr. MAXWELL AYRTON, joint architects, 3 Verulum Buildings, Gray's Inn, W.C.

| | | | |
|---|---|---|---|
| Killby & Gayford | £2,890 | 0 | 0 |
| Hunt | 2,836 | 0 | 0 |
| Kerridge & Shaw | 2,696 | 0 | 0 |
| Ekins & Co. | 2,686 | 0 | 0 |
| Downs | 2,677 | 0 | 0 |
| Cooper & Sons | 2,537 | 0 | 0 |
| Lowe & Sons | 2,492 | 0 | 0 |
| Parnell & Son | 2,409 | 0 | 0 |
| FAIRHEAD & SON, Enfield (*accepted*) | 2,357 | 0 | 0 |

### HALSTOW.

For sanitary improvements at the Council school, Lower Halstow, Kent. Mr. W. H. ROBINSON, architect.

| | | | |
|---|---|---|---|
| Edmonds | £349 | 0 | 0 |
| Monk | 275 | 0 | 0 |
| Bowes | 263 | 10 | 0 |
| Kemp Bros. | 259 | 0 | 0 |
| Brittenden, Sittingbourne (*recommended*) | 221 | 16 | 0 |

### HINCKLEY.

For the erection of additions to Messrs. S. Davis & Sons' factory. Messrs. HEATON & WALKER, architects, Hinckley.

| | | | |
|---|---|---|---|
| Johnson & Son | £1,550 | 0 | 0 |
| Hall & Son | 1,489 | 0 | 0 |
| Mould | 1,459 | 19 | 1 |
| Rowley | 1,450 | 0 | 0 |
| Sharp | 1,434 | 5 | 0 |
| Cole & Sons | 1,428 | 0 | 0 |
| Littler & Son | 1,420 | 0 | 0 |
| Hickman | 1,399 | 0 | 0 |
| Greaves | 1,383 | 6 | 6 |
| Potter | 1,379 | 10 | 0 |
| Bentley & Co. | 1,379 | 0 | 0 |
| Clarke | 1,378 | 0 | 0 |
| Flavell | 1,362 | 8 | 0 |
| Southam & Son | 1,358 | 9 | 0 |
| Chaplin | 1,355 | 0 | 0 |
| Jeffcote | 1,345 | 10 | 0 |
| GOODMAN & SON, Hinckley (*accepted*) | 1,328 | 0 | 0 |

### LONDON.

For painting work, Plaistow Hospital, for the West Ham Borough Council.

| | | | |
|---|---|---|---|
| Kemp | £620 | 0 | 0 |
| E. & A. Jenkin | 572 | 12 | 0 |
| Warman | 561 | 10 | 6 |
| Horswill | 530 | 0 | 0 |
| Harris | 518 | 0 | 0 |

### LONDON—*continued.*

| | | | |
|---|---|---|---|
| Lovely | 516 | 16 | 0 |
| King & Barker | 483 | 0 | 0 |
| Jerram | 473 | 0 | 0 |
| Woollaston Bros. | 423 | 0 | 0 |
| Burns & Co. | 406 | 8 | 6 |
| Oram & Son | 402 | 8 | 0 |
| Stokes & Sons | 396 | 13 | 0 |
| Wright & Co. | 382 | 18 | 0 |
| Innes | 377 | 5 | 9 |
| Roberts & Co. | 369 | 0 | 0 |
| Woollaston & Co. | 355 | 0 | 0 |
| Fenn | 344 | 0 | 0 |
| Dyke | 333 | 0 | 0 |
| Squire | 323 | 14 | 10 |
| Hocking | 318 | 0 | 0 |
| MOSELEY, Queen's Park, N.W. (*accepted*) | 247 | 0 | 0 |

For the extension of the existing West Silvertown school and erection of a new boys' department, for the West Ham education committee.

| | | | |
|---|---|---|---|
| Webb | £12,859 | 0 | 0 |
| Lawrance & Sons | 12,353 | 0 | 0 |
| Lawrence & Son | 11,500 | 0 | 0 |
| Woollaston & Co. | 11,455 | 0 | 0 |
| Coxhead | 11,400 | 0 | 0 |
| Moss | 11,241 | 10 | 0 |
| Symes | 10,997 | 0 | 0 |
| Jerram | 10,876 | 0 | 0 |
| Maddison | 10,550 | 0 | 0 |
| HORSWILL, Forest Gate (*accepted*) | 10,097 | 0 | 0 |

### READING.

For alterations and additions to nurses' home, the workhouse. Mr. W. ROLAND HOWELL, architect, Reading, and 18 Percy Street, London, W.

| | | | |
|---|---|---|---|
| Curtis | £2,396 | 0 | 0 |
| Sutton | 2,305 | 0 | 0 |
| Collier & Catley | 2,200 | 0 | 0 |
| Margetts & Son | 2,187 | 0 | 0 |
| Mc. E. Fitt | 2,172 | 0 | 0 |
| Newberry | 2,150 | 0 | 0 |
| Lewis & Bro. | 2,060 | 0 | 0 |
| Webber & Son | 1,991 | 0 | 0 |
| Patience & Son | 1,988 | 0 | 0 |
| GODWIN, Reading (*recommended*) | 1,909 | 0 | 0 |
| *Heating.* | | | |
| SPENCER, Reading (*recommended*) | 56 | 10 | 0 |

### SAWBRIDGEWORTH (HERTS.).

For sewerage works, for the Urban District Council.

| | | | |
|---|---|---|---|
| Mornement & Ray | £10,481 | 19 | 3 |
| Morley & Sons | 10,301 | 8 | 2 |
| Deakin | 10,065 | 3 | 10 |
| Muirhead & Co. | 9,889 | 0 | 0 |
| Braithwaite & Co. | 9,754 | 9 | 4 |
| Acme Flooring Co. | 9,629 | 18 | 8 |
| Honour & Son | 9,591 | 17 | 1 |
| Lawrence & Son | 9,250 | 0 | 0 |
| Johnson Bros. | 9,180 | 13 | 5 |
| Dix & Co. | 9,162 | 12 | 11 |
| Mitchell & Son | 8,993 | 12 | 2 |
| Pethick Bros. | 8,937 | 0 | 0 |
| Pedrette | 8,920 | 19 | 2 |
| Wickstead & Co. | 8,868 | 2 | 9 |
| Bell & Sons | 8,642 | 13 | 6 |
| Jackson | 8,503 | 14 | 10 |
| Ireland | 8,832 | 0 | 0 |
| Wood & Son | 7,993 | 19 | 3 |
| Nunn & Co. | 7,952 | 4 | 1 |
| Paul | 7,882 | 0 | 0 |
| Johnson & Langley | 7,791 | 2 | 1 |
| W. & C. French | 7,298 | 0 | 0 |
| Brebner & Co. | 7,090 | 19 | 8 |
| FARR, Frinton-on-Sea (*accepted*) | 6,749 | 0 | 0 |
| *Iron Pipes.* | | | |
| LOWCOCK (*accepted*), per ton | 4 | 17 | 0 |
| *Lifts, lift tower, manhole covers and vent pipes.* | | | |
| ADAMS (*accepted*) | 905 | 17 | 0 |
| *Automatic apparatus.* | | | |
| ENOCK & Co. (*accepted*) | 246 | 0 | 0 |

### RUGBY.

For the erection of a skating rink in Railway Terrace for Mr. George Duxbury, Leicester. Mr. A. HALL, architect, 8 St. Martin's, Leicester.

| | | | |
|---|---|---|---|
| Moore | £3,650 | 0 | 0 |
| Foster & Dicksee | 3,555 | 0 | 0 |
| Hollowell | 3,520 | 0 | 0 |
| Parnell & Son | 3,491 | 10 | 0 |
| Clark & Garrett | 3,430 | 0 | 0 |
| Cockerell | 3,395 | 0 | 0 |
| Harris | 3,355 | 0 | 0 |
| Elliott | 3,118 | 0 | 0 |
| Bowles & Son | 3,111 | 0 | 0 |

### SCOTLAND.

For building Galashiels Burgh Academy, Melrose Road. Messrs. J. & J. HALL, architects, Galashiels.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| G. & R. Cousin, mason work | £1,916 | 19 | 0 |
| W. & T. Hobkirk, joiner work | 1,270 | 18 | 3 |
| Scott, fittings | 495 | 9 | 10 |
| Mackenzie & Moncur, heating | 347 | 6 | 0 |
| Tweedie & Son, plumber work | 296 | 13 | 10 |
| Gardiner, plaster work | 279 | 10 | 1 |
| Fairbairn, iron work | 217 | 15 | 1 |
| McLaren & Sons, slater work | 165 | 9 | 2 |
| Speins & Co., cookery | 148 | 10 | 0 |
| Tait Bros., painter work | 140 | 17 | 0 |
| Mitchell, glazier work | 61 | 9 | 3 |

### SOUTHAMPTON.

For private street works. Mr. J. A. CROWTHER, borough engineer.

| | | | |
|---|---|---|---|
| *Empress Road.* | | | |
| Dyer & Sons | £1,235 | 0 | 0 |
| Tryhorn | 1,136 | 3 | 0 |
| Osman | 1,068 | 0 | 0 |
| Douglas | 935 | 0 | 0 |
| NICHOL, Southampton (*accepted*) | 923 | 0 | 0 |
| *Imperial Road and Kingsbury Road.* | | | |
| Dyer & Sons | 830 | 0 | 0 |
| Tryhorn | 714 | 0 | 0 |
| Osman | 697 | 0 | 0 |
| Nichol | 616 | 0 | 0 |
| DOUGLAS, Southampton (*accepted*) | 566 | 0 | 0 |

### STOTFOLD.

For new farm buildings at Manor Lodge. Mr. S. REDHOUSE, junr., architect, Letchworth Garden City, Herts.

| | | | |
|---|---|---|---|
| Beckley & Turpie | £1,023 | 13 | 6 |
| Hudson | 996 | 0 | 0 |
| Raban & Sons | 884 | 0 | 0 |
| Launder | 817 | 0 | 0 |
| Morris & Son | 799 | 0 | 0 |
| Redhouse & Son | 750 | 0 | 0 |
| BAILEY & Co., Ashwell (*accepted*) | 680 | 0 | 0 |

### WALES.

For the erection of new schools at Port Talbot, for Glamorgan County Council Education Committee. Mr. W. JAMES NASH, A.R.I.B.A., architect, Neath.

| | | | |
|---|---|---|---|
| Jenkins | £17,000 | 0 | 0 |
| Cox | 16,054 | 18 | 3 |
| Waring, Cole & Waring | 15,152 | 7 | 0 |
| Davies & Howell | 14,293 | 10 | 10 |
| Davies & Sons | 14,154 | 0 | 0 |
| Goodridge & Son | 13,978 | 0 | 0 |
| Loughor & Co. | 13,261 | 7 | 2 |
| Mercer | 12,695 | 0 | 0 |
| WILLIAMS, Cardiff (*accepted*) | 3,892 | 0 | 0 |

For new girls' school at Gilfach Fargoed, for the Glamorgan education committee. Mr. D. PUGH-JONES, F.S.I., county architect. architect.

| | | | |
|---|---|---|---|
| Shail | £4,816 | 0 | 0 |
| D. Davies & Sons | 4,300 | 0 | 0 |
| H. Davies | 4,254 | 18 | 0 |
| Hamilton & Millard | 4,168 | 0 | 0 |
| Howells | 4,100 | 0 | 0 |
| Davies & Howell | 3,998 | 0 | 0 |
| Davies & Lloyd | 3,990 | 0 | 0 |
| Bond | 3,910 | 0 | 0 |
| WILLIAMS, Cardiff (*accepted*) | 3,892 | 0 | 0 |

### WALES—*continued.*

For erection of a cottage hospital at Pontypridd. Messrs. A. O. EVANS, WILLIAMS & EVANS, architects, Pontypridd.

| | £ | s. | d. |
|---|---|---|---|
| Willis | £5,125 | 0 | 0 |
| Jones Bros., Aberdare | 4,615 | 0 | 0 |
| Hallett | 4,300 | 0 | 0 |
| Hamilton & Millard | 4,024 | 0 | 0 |
| Williams & James | 3,866 | 12 | 6 |
| Davies & Sons | 3,841 | 0 | 0 |
| Allan | 3,708 | 10 | 8 |
| Knox & Wells | 3,663 | 0 | 0 |
| R. Jones | 3,621 | 12 | 6 |
| Jones Bros., Treharris | 3,600 | 0 | 0 |
| EVANS & BROS., Cathays (*accepted*) | 3,590 | 0 | 0 |
| Colborne | 3,569 | 0 | 0 |

### WELLINGBOROUGH.

For erecting girls' secondary school. Messrs. SHARMAN & ARCHER, architects, Wellingborough.

| | £ | s. | d. |
|---|---|---|---|
| Marriott | £9,460 | 0 | 0 |
| Stevens | 9,320 | 0 | 0 |
| Lewin & Son | 8,997 | 10 | 0 |
| Archer & Sons | 8,532 | 0 | 0 |
| Hickman | 8,463 | 2 | 6 |
| Goodman & Murkett | 8,418 | 0 | 0 |
| Brown & Son | 8,405 | 0 | 0 |
| HACKSLEY BROS., Wellingborough (*accepted*) | 8,353 | 0 | 0 |

## TRADE NOTES.

ONE of the burning questions of the political campaign so far as it concerned the building trades has been the possible effects of the imposition of a tariff on imported joinery. The Free Trade argument is that the cost of building small class property would thereby be increased, and in consequence the weekly rent would have to be raised. Assuming this to be true, there remains the fact that the difference between workmen earning no wages and workmen earning good wages is out of all proportion to, say, the difference between the first paying 4*s.* and the second paying 4*s.* 3*d.* a week rent. But as a matter of fact, there is at least one English firm which even under the present illogical conditions compete shilling for shilling against the foreign article. Messrs. C. Jennings & Co., Bristol, have British-made doors from 4*s.* each, and keep 25,000 in stock. In addition they turn out at their joinery works woodwork of all kinds and prices, and for all purposes. Messrs. Jennings pertinently say "support home industries." It has been brought to their notice that on several occasions it has been stated that they supply a lot of foreign doors. This they contradict and state that they have not sold 100 foreign doors during the last five years. All have been their own make. Foreign doors were only supplied when specially requested. Messrs. Jennings used to import large quantities of foreign doors seven years ago, but are now competing with their own make notwithstanding the strenuous competition.

ORNAMENTAL STAIRCASE.
FANCY GATE.

AN economical partition slab is now on the market known as the "Muriblock." It is composed of seven parts of refined clinker (crushed and sifted to a quarter-inch gauge) and one part of the best English Portland cement. The slabs are 27 inches by 15 inches, and are made in three thicknesses, viz., 2¼ inches, 3¼ inches, and 4¼ inches. All the four edges are tongued and grooved, and the faces have a natural key, so that partitions can be very expeditiously fitted together and finished off with a single coat of plaster. The slabs will easily take nails and screws. Their weight is light as they are cored, which also renders them soundproof. This is not at the expense of strength, for according to a recent test by Messrs. David Kirkaldy & Son the crushing stress of a 4¼ inch slab was 28.2 tons per square foot. The slabs finally are fireproof. The makers—the Muriblock (Partition Slabs) Ltd., Wandsworth, S.W.—state that they are cheaper than any other partition slabs on the market. Full particulars and prices will be sent on application.

MESSRS. WITCHELL & Co., Ludgate Hill, E.C., have issued a small combined calendar and stamp case, which in about half a dozen pages gives a lot of useful and interesting information.

## VARIETIES.

THE Manchester City Council have given official notice that they propose to provide a public elementary school for about 1,200 children at Gorton, in the City of Manchester.

THE Caledonian Railway Company have, it is understood, decided upon the much needed rebuilding of their station at Port Glasgow.

HER MAJESTY'S THEATRE, Guild Street, Aberdeen, is to be converted into a music hall at a cost of 5,000*l.* The plans have been approved by the Town Council.

THE Highland Railway Company have made arrangements for building a hotel at Strathpeffer, N.B., at a probable cost of 32,000*l.*

THE Government of India have accorded administrative approval to a proposal to construct a new Customs building at Rangoon, at a probable cost of about 4,50,000 rs. (30,000*l.*).

A PROJECT is on foot for the establishment of a spa at Pöstyén (Hungary). The cost is estimated at 1,500,000 kronen (about 63,000*l.*). The scheme will include the building of an hotel.

THE Coventry City Council on the 25th inst. adopted a scheme for the extension of the electric light department at an estimated cost of 54,000*l.* Plant to the value of 5,000*l.* will be scrapped.

THE plans for a new engineering laboratory to be erected within University College Buildings, Dundee, are under consideration by the Works Committee. The cost of building and equipment will be about 14,000*l.*

THE Liverpool Burials Board have received the approval of the Local Government Board to borrow 12,500*l.* for the erection of three chapels in Allerton Cemetery. The plans are to be prepared at once by the city engineer.

THE Court of the Carpenters' Company, at their last meeting, voted the sum of over 800*l.* in donations and subscriptions to various charitable and other institutions. This sum is quite apart from the amount expended by this Company on education—technical and otherwise.

THE Court of Common Council have directed their General Purposes Committee to consider and report as to the expediency of directing that in future a clause be inserted in all tenders and contracts for the supply of manufactured articles required for the Corporation, that such articles should be of British manufacture.

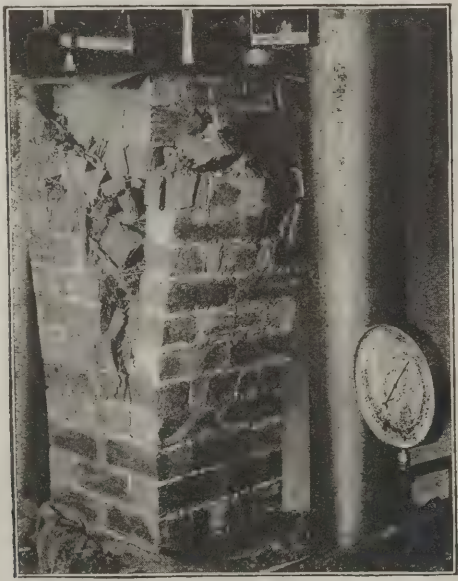
THE Hooton education committee have decided to issue statutory notices for the provision of two new schools in Wirral. One school, to accommodate 170 children, will be erected at Willaston, and the other will serve the parishes of Childer Thornton, Hooton, and Little Sutton. The latter will accommodate 180 children.

THE Tame and Rea Drainage Board have accepted the following tenders:—Messrs. Jones & Attwood, of Stourbridge, for the supply of distributing pipes for the bacteria beds at Saltley, on a basis of schedule of prices; the Staveley Coal and Iron Company, in the sum of 11,441*l.* 11*s.* for cast-iron pipes, &c., for supply main to bacteria beds at Minworth; Clay Cross Company, in the sum of 3,827*l.* 19*s.* 2*d.*, for cast-iron pipes, &c., for sludge main.

MR. W. WADDELL, chief officer of the Glasgow Fire Brigade, has issued the twenty-fifth annual report of the Fire Department. Referring to the question of defective building construction, Mr. Waddell says:—"I regret to record so large a proportion of fires due to defective building construction. The utmost care should at all times be exercised when buildings are being erected to avoid joists or beam ends from running into chimney walls. Fires from such causes occur year after year. Indeed, from such defects no less than 241, or 37.3 per cent., of the total fires appear in the 'causes table.' Four, or 1.6 per cent., of the defects occurred in buildings erected since the passing of the Building Regulations Act, 1892. These defects, as hitherto, have been regularly reported to the Master of Works Department, and all necessary measures for improvement have been taken advantage of during the reconstruction of the buildings." The loss in 1909 amounted to 163,000*l.*, compared with 65,000*l.* in 1908.

## REINFORCED BRICKWORK TESTS.

At the Municipal Technical School in Manchester some important crushing tests were carried out last October in order to ascertain the strength of a reinforced brick pier in comparison with an ordinary brick pier. Two piers were built, both were 18 inches square, and 16 courses (4 feet 7 inches) high, were built of common wire-cut bricks set in 1—1 Portland cement mortar, and were both three days old when tested. The only difference between them was that one was reinforced in every horizontal joint with "Johnson's patent conical mesh wire netting reinforcement." An interesting illustrated leaflet has been issued by Messrs. Rd. Johnson, Clapham & Morris, Ltd., the sole manufacturers of the Johnson patent, showing the behaviour of the two piers. The accompanying block shows the reinforced pier after the severe load of 260 tons had been applied, and had then gradually fallen off.



It will be observed that the top of the pier has formed a kind of pyramid, which in the fashion of a wedge has more or less split through all the courses except the lower four, which remain intact. More important than this, however, is the action of the reinforcement, which, it will be seen, is holding the pier together. The test was continued until the pier stood only 33 inches in height, the crushing being facilitated by any heavy pieces of brick which had partly broken away, being removed. But the four lower courses still held.

In the plain pier the splitting occurred practically from top to bottom with a crushing load of 189 tons; and when the height was reduced by only 4 inches the pier had become the shape of a double cone joined at their apexes.

This test points to the great increase of strength, about 37 per cent., secured by the introduction of the wire-netting reinforcement. Here then is an alternative to the steel stanchions enclosed in some fire-resisting material which are such an unreliable factor in the event of fire. It is acknowledged by all that plain brickwork will resist enormous heat and sudden changes of temperature. The area of the patent reinforcement is so small that its expansion would have little or no effect if introduced. Whereas the expansion and bending of the stanchion, if the protective covering is at all faulty, has been the frequent cause of dragging down whole floors. The opinion of Mr. A. Pordage, the firemaster of Edinburgh, on the subject of fire-resisting construction will be accepted as that of a specialist, and in a recent issue of the *Architect* the following remarks by him on brickwork appeared:—"Brick is least affected of all material, and will withstand the exposure to a fierce fire and application of water many times without detriment to its stability. I have not found in my experience any other form of construction of which the same may be said."

## NEW ADULT SCHOOL, SUTTON, SURREY.

This building at the corner of Benhill Avenue and Lichfield Road, Sutton (the gift of Mr. Thomas Wall), was formally opened on Saturday, the 8th inst.

The area covered by the building is 8,250 square feet. The main hall is 68 feet long by 37 feet wide. Opening from it on either side are class-rooms, which are so arranged that they can, if desired, be divided off from the hall by curtains and from each other by means of sliding partitions. When these are used in connection with the hall there is an auditorium accommodating nearly 1,000 persons each of whom may command a view of the platform. An organ chamber is provided, this being placed in a gallery which forms a feature at the platform end of the hall on the west side. Cloak-room accommodation for both sexes is provided in close and convenient proximity to the principal entrance, while at the platform end there is a vestry and a ladies' parlour. A kitchen is also provided.

In addition to the wide principal entrance and vestibule there are exits at the platform end of the hall on either side so that facilities of egress are ample and convenient.

In addition to the main hall, with the adjuncts mentioned, there is at the rear a gymnasium 37 feet by 20 feet, with separate entrance and lavatory accommodation.

On the first floor are provided a committee room, games room, and reading room, in connection with which also lavatory accommodation is provided. The caretaker will be resident and suitable apartments have been provided with separate entrance.

The building has been designed in the Renaissance style of the seventeenth century; the treatment is simple in character and free from superfluous ornament, its pleasing effect being obtained by means of good proportions and careful choice of materials and colour. The brickwork is in dark red sand faced Ockley bricks, and the roof is tiled to harmonise therewith. The windows are lead glazed. The main entrance from Benhill Avenue is approached by a flight of steps 16 feet wide.

The architects were Messrs. Frederick Wheeler, Son & Searle, of 7 Stone Buildings, Lincoln's Inn, W.C., and the builders were Messrs. F. & H. F. Higgs, of Herne Hill, S.E. Mr. Knight was the foreman.

Special works were carried out by the following firms:—Heating and ventilation, Messrs. J. H. Nicholson & Co., 110 Cannon Street, E.C.; roof tiling and moulded bricks, Messrs. Ames & Hunter, 7 Martin's Lane, E.C.; floor tiling, Messrs. Craven, Dunnill & Co., 37 Maddox Street, W.; electrical work, Mr. William Newton, 58 North Street, Clapham, S.W.; electric-light fittings, the Bromsgrove Guild 82 Victoria Street, S.W.; gas fittings, the Sutton Gas Co.; sliding partitions, the North of England School Furnishing Co., Darlington; special oak doors, the Gilmour Door Co., 51 Berners Street, W.; door furniture (including panic bolts), Messrs. Pfeil Stedall & Co., 3 Broad Street, W.C.; ornamental plasterwork, Messrs. H. H. Martyn & Co., Cheltenham; casements and glazing, Messrs. J. Chater & Son, St. Dunstan's Hill, E.C.; constructional steelwork, Messrs. A. Dawnay & Co., Battersea.

## THE WARMING AND VENTILATION OF PUBLIC BUILDINGS AND FACTORIES.*

(*Continued from last week.*)

By T. W. Aldwinckle, F.R.I.B.A.

As the plenum will be required without warming during the summer, a bye-pass duct should be provided by which the air driven by the fan can enter the main duct without passing through the heating battery. One reason for this is that these batteries offer considerable resistance to the air, and thereby increase the work of the fan. In America the main ducts are frequently in duplicate, one for warm air and one for cold air, with mixing chambers and regulating dampers at the base of each vertical air-shaft. This admits of the temperatures of the air entering the room being well regulated. In that country they use, however, as a rule, small ducts with high velocities of air. There is no room for this duplication of ducts upon the principles proposed in this paper.

The general arrangements of the main and branch ducts will depend upon the nature of the building, the number of floors, and the purpose for which the rooms or halls are used. But one general principle should be followed, viz., that of large sectional areas and low velocities as already explained. Another good reason is that the ducts should, as far as possible, be large enough for access for cleaning purposes. This is of the highest importance, as, without the means for frequent and thorough cleaning, these ducts can, and indeed frequently do, become very dirty and foul, and as such are a source of danger to health. As a matter of sound principle there should be no portion of any ducts

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* A paper read before the Association of Engineers in-Charge on January 12.

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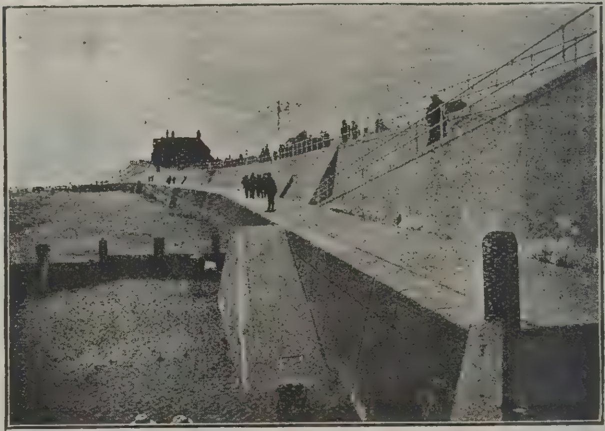

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or any inlet which cannot be easily cleansed out. This may appear a large order, but it is perfectly feasible and is absolutely essential. This matter of foul and unclean ducts is a strong argument frequently used against the plenum system, and it is one to which the most careful attention should be given.

The velocity at which the air enters the room or hall will vary with the conditions—with downward ventilation, say, in a theatre, with the air entering at or near the ceiling and consequently well above persons' heads, a fairly high velocity is allowable, especially if the air current will have to travel some distance; but where the inlets are near the occupants of the room a velocity of 3 to 4 feet per second will be sufficient, provided that the collective area of the inlets is sufficient to provide the requisite amount of air at such a velocity. The angle at which the air jet will enter has to be carefully considered, according to the circumstances of the case. Each inlet should also have a regulatory valve, as simple and ready control is the essence of all good ventilation. The temperature at which the air will enter the room must be definitely arranged, and must be capable of ready adjustment at the heating battery as already described. This comes to be a matter of much importance in places where large numbers of persons assemble, such as theatres and the like. Each adult person gives off about 400 thermal units of heat per hour, so that an audience in a theatre numbering, say, 1,500 persons, with an air allowance of 1,000 cubic feet per head per hour, will, in one hour, have given off sufficient heat to raise the temperature of the air 22° Fahr. Such being the case, it is obvious that the incoming air would usually have to enter at a temperature lower than that of the auditorium.

One of the most difficult buildings to warm and ventilate is a public elementary school. The cubic space per child in the class-rooms is only 140 feet, and windows are not desirable (for lighting purposes) on both sides of the room. Open fireplaces are almost out of the question. This is an instance when "natural" ventilation fails altogether, the proportion of $CO_2$ with such ventilation often rising to as much as 18 parts in 10,000 during the winter months. Any attempt to improve this by large inlets of air through open windows only lowers the temperature to 52° or 53°, which is much too low for children to sit and work in, to say nothing of the inevitable draughts. Dr. Kerr, the medical officer to the education committee of the London County Council, in his report for the year ending March, 1904, points out the failure of natural ventilation in the case of London schools, and strongly recommends mechanical ventilation, preferably a combination of plenum and exhaust, with an air supply of 1,500 cubic feet per child per hour, which is about eleven changes of the air per hour. The effect of temperature upon the children's work is also dealt with by Dr. Kerr. He says, "From inquiries it seems that the London school child takes little notice of variations in temperature between 56° and 64°, and apparently does its best work at about 58°. A fall below 55° gives rise to comment, and a rise to 65° to unpleasant subjective symptoms, slackness and inattention in some, headaches in others."

As to the relative merits of "upward" and "downward" ventilation, much will depend upon the character and purposes of the building. The exhaust system seems to lend itself to upward ventilation, and provided that the air inlets are not too high above the floor line the arrangement is simple and effective. It is most suitable for council rooms, classrooms, factories, workshops, and the like, where the air is removed at once upwards from the breathing line. It does not appear to be so suitable for any class of building with galleries. There is also this in its favour, that as the vitiated air is warm and tends to rise, and as the convection currents set up by the bodies of persons are also upward, the upward system is following to some extent natural laws.

There are, however, instances of exhaust ventilation, notably the removal of dust, &c., from factories, to be afterwards described, where downward exhaust is far preferable.

Downward mechanical ventilation would seem to be the most suitable for theatres, public halls, and all crowded places having galleries, the system being plenum with exhaust. The warmed fresh air can be driven in at a moderate velocity from the ceiling, or at a level near the ceiling line, without causing any perceptible draughts. The air intake being at the top of the building, the source will be purer than elsewhere. The incoming air will be naturally distributed throughout the whole of the auditorium, and will find its exit at the lower part of the hall, the outlet current being induced by exhaust fans, and the exits being under the seats, against the walls, and in other suitable positions, and not causing any perceptible draughts. This is preferable to bringing in the fresh air under seats and similar positions, as such inlets cannot be kept clean, but will always be clean enough for vitiated air to pass out through. As the audience are, after a short time, as previously explained, practically providing all the warming, it is a great advantage that the entering air, which under these circumstances must be cool, should enter at some distance from the audience, or cool draughts might be experienced. The trouble as to the vitiated air of one tier of galleries being carried up or down to another (a trouble associated with both upward and downward systems) can, to some extent, be obviated by having exhaust outlets in connection with each tier. Theatres and similar buildings are usually free from the down draughts arising from the cooling surfaces of windows and skylights, and this greatly simplifies the arrangements, as these down draughts are very serious and very difficult to deal with.

It is possible to have the plenum upward system without auxiliary exhaust, provided the outlets are efficient in area, in suitable positions, and properly protected against the disturbing action of wind, but downward ventilation with plenum only would not be so successful, as it is impossible to arrange outlets near the floor line without providing some exhausting power, as the downward current is in opposition to the natural upward tendency of the vitiated air, and such outlets would be useless against the wind and would most probably, some of them at least, become inlets. It follows, therefore, that in many cases the plenum and exhaust downward system will be somewhat expensive to instal, but its superior advantages are great, and it is the most complete system of ventilation I know of. The vitiated air is at once removed below the breathing line, the dust caused by work is removed beneath the worker, and the fumes from the laboratory benches are removed beneath the chemist or student. This is particularly the case in factories which are mostly top lighted. Any attempt to get rid of the air at the top is considerably checked by the downward currents of cold air set up by the cooling surfaces of the skylight. It is preferable, therefore, to have the warm air inlet sufficiently high and so deflected that the current of warm air shall travel along or near the ceiling line, and subsequently descend to the breathing line. The downward current will in that case be comparatively pure air.

In this connection it may be mentioned that the "natural" ventilation of a hospital ward in winter, with open windows and open fires, is practically "downward" ventilation, the open fireplaces being powerful exhausts close to the floor line.

Whatever the system of ventilation adopted, be it natural or mechanical, upward or downward, what is required is frequent changes of the air in the room, thus providing a large amount of air per occupant, the movements and distribution of the air being so arranged and controlled that the impurities which are given off shall be removed as soon as they arise without the possibility of their accumulating.

At the new bacteriological laboratories, recently erected at Sutton for the Metropolitan Asylums Board, I provided a system of plenum and exhaust ventilation and warming upon the lines I have here indicated. There are seventeen rooms thus ventilated, varying in size from 13 feet by 10 feet to 17 feet by 13 feet, and all are 10 feet high, and are on both sides of a central corridor. The building is one storey high, with a small basement. The fresh air is admitted through a large louvred opening, passes through a filter screen previously described, and is driven through a heating battery into the main central duct by a centrifugal fan at the rate of 180,000 cubic feet per hour. The heating battery consists of ten two-column radiators, each of 80 feet heating surface, in which water circulates at a temperature of 150° Fahr. Each radiator is controlled by a valve, so that any part of the battery can be put on or off, and thus regulated to suit the external temperature. The central duct is tapered and has low-pressure hot-water circulating pipes in same to maintain the temperature of the air. From this duct rise glazed fireclay branches, leading to the vertical inlets in the room, 18 inches by 9 inches, and 8 feet high, of cast iron, the whole of the front except the air inlet at the top being a door, as access for cleaning. Each inlet has a regulating valve, and is placed against the inner wall opposite to the windows. The air enters the room at a height of 7 feet 6 inches from the floor, at a velocity of 3½ feet per second, and the momentum carries it along the ceiling line to the opposite side, where the cooling action of the windows causes it to descend. It then comes under the suction influence of the exhaust, which is close to the floor level on the same side of the room as the inlet. The air is then drawn into an exhaust duct below the floor, which runs into a vertical brick shaft about 28 feet high, at the top of which is a propeller fan discharging the air into the atmosphere. The power of the exhaust fan is somewhat less than that of the inlet for the reason already stated. The air of the rooms is changed about six times in the hour, and a temperature of 60° is easily maintained when the external temperature is 20°. Owing to the heating surfaces having a low temperature there is a complete absence of that closeness and heaviness in the air of the rooms so frequently complained of in plenum systems.

The ventilation of factories is a subject by itself, as not only have the rooms to be warmed and ventilated, but noxious matters arising from many of the manufactures have to be separately removed, as near as possible at their point of origin, so as to prevent them from mixing with the general air of the room, and this we term "local" ventilation, as distinguished from "general" ventilation, which relates to the removal of vitiated air from the room. As regards general ventilation, the majority of factories are content with natural ventilation, as the results of open windows and skylights with steam heating, there being usually plenty of steam available. This is generally satisfactory where there is a fairly large cubic space per worker, but not otherwise. The Factory Act only requires a cubic space of 250 feet per worker, except during overtime, and the inspectors will pass a maximum of 12 parts of $CO_2$ in 10,000 during daylight, and 20 parts when gas is used as an illuminant. These are not very exacting standards. With a small cubic space mechanical ventilation is absolutely necessary, and according to tests in Haldane's Departmental Report of 1902, very satisfactory results have been attained in many factories where both plenum and exhaust fans have been used.

The removal of local impurities is, however, quite a different matter, and requires special treatment. The impurities to be removed consist of dust, fumes, steam, poisonous spray, sawdust, textile dusts, dust from metal polishing and grinding, and the like. Very interesting particulars of the methods in practice for getting rid of these impurities are given in Dr. Haldane's Second Report on the Ventilation of Factories and Workshops (Appendix), issued in 1907. The general principle is downward exhaust ventilation, occasionally supplemented by a plenum inlet. The point of origin of most of these impurities being at the worker's bench, and consequently below the worker's head, it is essential that such impurity should be immediately removed downward, so that it cannot be breathed by the worker. The introduction of a plenum inlet above the work will emphasise this downward movement, and prevent any dust from rising. In some cases the dust is drawn into a hood on a level with, but in front of the worker, in which case the plenum jet of air is at the back of the worker. But in every case the impurities are at once removed away from the worker. These extraction shafts remove the air and impurities at a very high velocity, much higher than the general ventilation. In the case of noxious fumes, such as those from linotype composing machines, the extraction is upward, there being placed over each melting pot a conical hood connected with a vertical pipe running into a horizontal trunk overhead, at the end of which is placed a powerful exhaust fan. At a very large cabinet-making works near London, where about 2,000 workpeople are employed, I saw an excellent system of both upward and downward exhaust ventilation in connection with the numerous circular-saw benches and other apparatus. The light sawdust was removed from above the bench, and the heavier chips were removed below the bench, all passing into overhead and underground trunks eventually uniting above, the material being driven into a chamber above the boiler house, to be sent through hoppers into the boiler house for use as fuel. The power to drive these fans was about 80 h.p. The whole of the foregoing arrangements are in the interests of the health of the workers. Employers who thus spend large sums of money for such a purpose have their reward in the increased health and vigour of their workpeople, and the improved capacity of the latter for producing good work.

In railway workshops and the like, large galvanised steel trunks run along a little above the springing of the roof, with outlets at regular distances. Fresh air (warmed in winter) is driven by a centrifugal fan through these trunks, and is thus distributed throughout the building. The outlets for the air generally consist of a number of large open doors. This air is generally distributed at high velocities.

Where there are large quantities of steam given off in workshops and factories, its removal cannot be effected by currents of cold air. The air blown in for this purpose must be warmed, at all events in winter.

(*To be continued.*)

## LONDON MASTER BUILDERS' ASSOCIATION.

A MEETING of the Council took place on Thursday, the 20th inst. The agenda was unusually interesting to the trade. The President (Mr. F. G. Rice) presided.

It was decided to distribute to the London members of the Royal Institute of British Architects, the Surveyors' Institution, and the Quantity Surveyors' Association the handbook published by the London Master Builders' Association.

One ordinary member and eleven associate members were proposed and duly elected.

The President (Mr. F. G. Rice) reported to the Council that he, together with Mr. Leonard Horner, Mr. G. Bird Godson, Mr. Frank May, Mr. J. Carmichael, Mr. F. Higgs and the Secretary met in conference representatives of the London Association of Master Masons (Mr. F. Corben, Mr. Walter Tomes, Mr. L. F. Chislett, and Mr. Walpole Collins), on January 18. The possibility of affiliating the two Associations was discussed very fully. The conditions to be observed were carefully considered, and the President laid it down very distinctly that the agreements made by the London Master Builders' Association with the workmen's societies must be strictly and honourably observed.

A Conference was also held with the London Association of Master Decorators when the London Master Builders' Association was represented by the President (Mr. F. G. Rice), Mr. Leonard Horner, Mr. G. Bird Godson, and Mr. James S. Holliday, with the Secretary in attendance, and the London Association of Master Decorators was represented by the President (Mr. H. A. Campbell), Mr. J. Anderson, Mr. F. Dakin, and the Secretary (Mr. A. Davidson). The affiliation of the two bodies was carefully considered and the President of the London Master Builders' Association (Mr. F. G. Rice) drew attention to the importance of strict observance of rules made by the L.M.B.A. with the trade unions.

At both these conferences expressions of sympathy and desire for affiliation were made, and it is hoped that eventually these and other bodies of employers in the building trade will be combined in taking united action in matters interesting to all those engaged in the industry.

An interesting discussion took place on this report, and the Council considered affiliation desirable and appointed a committee to consider what terms to recommend for affiliation to the London Master Builders' Association of other bodies and to report to the Council in due course.

The recommendations of the rules committee as to the amendment of the Association Rules were fully considered. The question of sub-contractors occupied a good deal of attention and several glaring instances were given of what master builders have to put up with from many who are employed on work which could be done more quickly, with less interference with the organisation of the working of the job, and, perhaps, better by the master builder himself. It was felt that some architects do not appreciate the loss of time, money, and, in some cases, the quality of workmanship, by the ever-increasing tendency to foist sub-contractors on those who have all the responsibility on the various works in hand. It was considered to be a great hardship on builders to be responsible for the work of sub-contractors who do the work that they (the builders) have facilities and ability to carry out, and of whom they have no selection, and, although it is admitted in some cases architects cease to employ sub-contractors whose want of consideration to the master builder warrants such a course, great hopes were expressed that architects would revert to the former practice of entrusting the master builder with the whole of the work formerly undertaken by him, and which would undoubtedly give him an added interest and pride in his work.

It was decided to hold the annual dinner on the 24th proximo.

The question of beginning work before the recognised "starting time" was considered.

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THE Walsall education committee have decided that application be made to the Town Council for their sanction to the erection at Bloxwich of a new public elementary school to accommodate 500 children at an estimated cost of 6,000*l*.

A POLL of Exmouth was taken on Monday, with the result that the ratepayers authorised the Urban Council to apply to Parliament for a Bill to extend the waterworks, some eight miles from the town.

THE

# Architect and Contract Reporter.

FRIDAY, FEBRUARY 4, 1910.

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## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

BLYTH.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

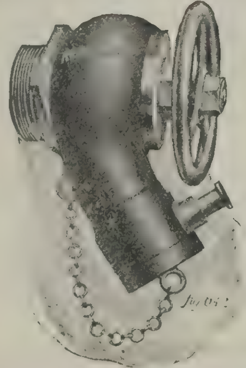
LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

LONDON.—Feb. 8.—The committee of the Architectural Association Play 1910 invite designs for a poster illustrating this year's play. Prize 1*l.* 1*s.* Mr. Percy Lovell, 23 Old Queen Street, S.W.

MARCH 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

PETERBOROUGH.—The local education authority invite competitive designs for erection of a secondary school at Peterborough to accommodate 250 scholars, but allowing for enlargement so as to accommodate 300 scholars. Mr. Walter J. Deacon, clerk to the Authority, Cross Street, Peterborough.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l.* Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s.* Apply before Feb. 10 to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.



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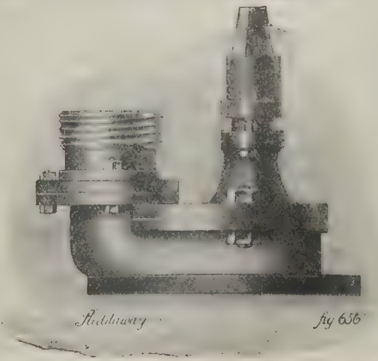

## CONTRACTS OPEN.

Aston.—The County Council of the West Riding of Yorkshire (Aston sub-committee) invite tenders for the following works:—(1) Swallownest provided school: Alteration of the heating apparatus, installation of gas in the old school; (2) Treeton provided school: Alterations and improvements to premises (trades: builder, joiner and plumber); (3) Catcliffe provided school: Asphalting and paving of the playground. Mr. S. Abson, Education Offices, Woodhouse.

Bingley.—Feb. 18.—The West Riding education committee invite whole or separate tenders for the following:—Bingley: Wilsden provided school, alterations and additions (builder, joiner, slater, plumber, plasterer and painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Bocking.—Feb. 16.—For erection of a new boiler house, sorting room, and other alterations to the existing laundry and kitchen at the Union workhouse, Bocking, Essex, for the Guardians of Braintree Union. Deposit 2*l.* 2*s.* Mr. J. W. Start, F.S.I., architect, Colchester.

Bradfield.—Feb. 18.—The West Riding education committee invite whole or separate tenders for the following:—Bradfield, Loxley New School: builder, joiner, slater, plumber, plasterer and painter. The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Canterbury.—Feb. 7.—For alterations and additions to the isolation cottage at the workhouse. Mr. H. Doré, architect, 82 Castle Street, Canterbury.

Chopwell, &c.—Feb. 5.—For erection of forty-six cottages at Chopwell and twenty cottages at High Spen, for the Consett Iron Co., Ltd. Forward names to the company's architect, Mr. Charles E. Oliver, at their General Offices, Consett.

Clifford.—Feb. 23.—For carrying out additions and alterations to the Council school at Clifford, near Hay. Deposit 1*l.* 1*s.* The County Surveyor, Shirehall, Hereford.

Dartford.—Feb. 28.—For the construction of an open-air swimming bath, for the Urban District Council. The Surveyor, Council Offices, Dartford.

Dewsbury.—Feb. 9.—For the mason and bricklayer, carpenter and joiner, plumber and slater work required in additions to business premises in Dewsbury. Messrs. Joseph Firth & Son, Vulcan Road, Dewsbury.

Durham.—Feb. 15.—The County Council invite tenders (1) for the erection of new schools at Usworth Colliery, Castletown, and New Lambton (apply Mr. W. Rushworth, Shire Hall, Durham); and (2) for extensions at Eldon Lane school (apply Mr. F. E. Coates, Shire Hall, Durham).

Edinburgh.—Feb. 22.—For raising existing car sheds, roofs, &c., at Henderson Row cable power station. Deposit 2*l.* 2*s.* Mr. J. Walker Smith, burgh engineer, City Chambers, Edinburgh.

Ellesmere.—Feb. 4.—For erection of six cottages and six sets of farm buildings for small holdings at the Trench, about 2 miles from Ellesmere station, for the Salop County Council. Deposit 2*l.* 2*s.* Mr. W. T. Hall, agent, College Hill, Shrewsbury.

Enfield.—Feb. 7.—For the construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, Enfield, for the Metropolitan Water Board. Send 10*l.* deposit to the Accountant at Savoy Court, Strand, W.C. The Chief Engineer, Savoy Court, Strand, W.C.

Fulwood.—For proposed alterations and additions to Storth House, Fulwood, Sheffield. Messrs. W. H. Lancashire & Son, architects, Hartshead, Sheffield.

Great Yarmouth.—Feb. 14.—For erection of fishing premises, South Denes. Mr. Chas. G. Baker, architect, Town Hall Chambers.

Halifax.—Feb. 7.—For the mason, joiner, plumber and glazier work required in the conversion of old engine-house into workshops at Woodside Mills, Haley Hill. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

Halifax.—Feb. 14.—For the excavator, mason and bricklayer, carpenter and joiner, slater and plasterer, plumber and glazier, and electric lighting in the erection of a detached residence, garage, boundary walls, and other appurtenances at Greenroyd. Mr. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

Handsworth.—Feb. 22.—For the erection of a new station at Handsworth, Birmingham, for the Great Western Railway. The New Works Engineer, Paddington Station, London.

Hollingbourn.—Feb. 9.—For the erection of a destructor at the infectious hospital. Mr. H. J. Bracher, clerk, 33 Earl Street, Maidstone.

Ireland.—Feb. 19.—For building St. Eugene's Boys' National School, Rosemount, Londonderry, and for plumbing, heating (by low pressure hot water), and electric light fitting at same. Deposit 1*l.* each. Mr. Edward J. Toye, architect, Northern Gate, Londonderry.

Lancaster.—Feb. 15.—For extensions at the County Asylum. Deposit 2*l.* 2*s.* Apply by Feb. 5, to Mr. H. Aspinall, F.R.I.B.A., 36 Dale Street, Liverpool.

Leadgate (Durham).—Feb. 21.—For erection of new stores at Allendale Cottages. The Leadgate Industrial and Provident Society, Ltd., Leadgate, Durham.

Lincoln.—Feb. 8.—For construction of engine house, boiler house, economiser house, cold store, workshop and stores forming the main building; and chimney, engineer's house, cottages, and subsidiary works, at Elkesley, Notts, 2¾ miles from Checker House Station, and 6 miles from Retford, for the Lincoln Corporation. Send 5*l.* 5*s.* to the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

London.—For building 100 houses of bungalow type on the East Coast. Messrs. Browne & Folkard, surveyors, 117 Victoria Street, S.W.

London.—Feb. 10.—For erection of new melting houses, &c., at the Royal Mint. Deposit 1*l.* 1*s.* Mr. H. N. Hawks, I.S.O., H.M. Office of Works, &c., Storey's Gate, S.W.

Margate.—Feb. 7.—For alterations to cottages at the Wingham pumping station, and also the redecoration of the interiors. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

Milnsbridge.—Feb. 10.—For erection of dining-room, lavatory, &c., at the Chemical Works. Messrs. Lunn & Kaye, architects, Milnsbridge and Huddersfield.

Pettaugh.—Feb. 7.—For erection of a new school for about 60 children at Pettaugh, near Stowmarket. Deposit 1*l.* 1*s.* Send names to Mr. W. E. Watkins, secretary, Education Office, County Hall, Ipswich.

Preston.—Feb. 10.—For erection of park-keeper's lodge, main entrance, boundary walls, conveniences, &c., at the Haslam Park. Deposit 1*l.* 1*s.* The Borough Surveyor, Town Hall, Preston.

Rudgwick.—Feb. 9.—For alterations and additions to the Queen's Head, Bucks Green, Rudgwick, near Horsham. Mr. C. H. Burstow, architect, 6 West Street, Horsham.

St. Dennis.—Feb. 25.—For erection of a dwelling-house and shop at Fore Street, St. Dennis, Cornwall. Mr. B. C. Andrew, M.S.A., architect, Biddick's Court, St. Austell.

Scotland.—Feb. 14.—For mason, joiner, plumber, slater, plaster and painter works required in connection with alterations and additions to Aberchalder Farm House Steading, and new cottage for ploughman, Invergarry Estate. Messrs. L. & J. Falconer, architects, Fort William.

Scotland.—Feb. 22.—For the erection of a new post office at Kelso. Deposit 1*l.* 1*s.* H.M. Office of Works, Parliament Square, Edinburgh.

Scotland.—Feb. 25.—The district committee of the Middle Ward of the County of Lanark are prepared to receive tenders for the erection of buildings to contain refuse destructor; also for steel chimney stack, the provision of water supply and drainage, and the formation of access road and other relative works at Boggs Brae, near Bellshill. Deposit 1*l.* Mr. W. L. Douglass, C.E., district engineer, District Offices, Hamilton.

Seaforth.—Feb. 21.—For erection of the Rawson Road school, Seaforth, near Liverpool, for the Waterloo with Seaforth Urban District Council. Bills of quantities may be obtained from Mr. John I. Thompson, clerk, Town Hall, Waterloo, near Liverpool, upon payment of a deposit of 1*l.* 1*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Skelmanthorpe.—Feb. 9.—For rebuilding the National schools. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

South Shields.—Feb. 14.—For the formation of the forecourt of the Municipal buildings. Apply to the Town Clerk, or to Mr. E. E. Fetch, A.R.I.B.A., 20 John Street, Adelphi, London, W.C.

Swanland.—Feb. 5.—For alterations to house and buildings at Humber Field Farm, Swanland, near Hessle, Yorks,

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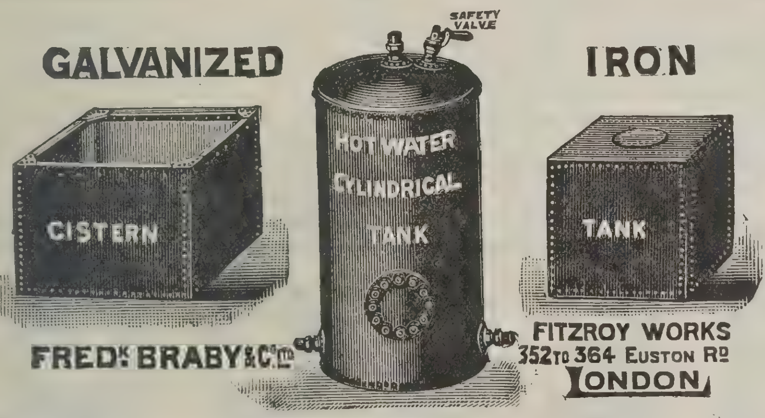

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Tewkesbury.—Feb. 7.—For alterations to one of the market shops, Station Street. Mr. Walter Ridler, borough surveyor, Station Street.

Thornton-in-Craven.—Feb. 4.—The West Riding education committee invite whole or separate tenders for the following work:—Thornton-in-Craven, Earby new school (builder, joiner, slater, plasterer, plumber, painter). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, County Hall, Wakefield.

Todmorden.—Feb. 5.—For the demolition of Lobb Mill to the second-floor level. Mr. J. A. Heap, borough surveyor, Town Hall, Todmorden.

Torquay.—Feb. 10.—For erection of a post office for H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

Twickenham.—Feb. 9.—For taking down and rebuilding portions of the boundary wall, tool shed and other works in connection therewith, at the Oak Lane Burial Ground. Mr. Fred W. Pearce, F.S.I., surveyor, Town Hall, Twickenham.

Tynemouth.—Feb. 9.—For execution of alterations at the workhouse. Deposit 1*l.* 1*s.* Mr. H. Gibson, architect, 56 Camden Street, North Shields.

Wakefield.—Feb. 9.—For erection of a lodge on the St. John's Estate, for the Governors of the Wakefield Charities. Send names to Mr. W. Wrigley, A.R.I.B.A., architect, 2 King Street, Wakefield.

Wales.—Feb. 7.—For the partial reconstruction, restoration and renovation of the following blocks of houses:—(1) Six houses, Beresford Road, south-west side; (2) three houses, Beresford Road, north-east side; (3) two houses, Moorland Road, for the Cardiff Corporation. Deposit 1*l.* Mr. Wm. Harpur, M.I.C.E., city engineer, City Hall, Cardiff.

Wales.—Feb. 7.—For the proposed riding school and stabling to be erected on the Barracks Field, Cardiff. Deposit 1*l.* 1*s.* Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wales.—Feb. 8.—For erection of a workmen's institute at Cross Keys (Mon.). Deposit 2*l.* 2*s.* Mr. R. L. Roberts, M.S.A., Abercarn.

Wales.—Feb. 9.—For the following works, for the Glamorgan County Council, viz.:—(1) Additions to the Council school at Braichycymmer; (2) new cloak-rooms at the Council school at Tondu; (3) foundations for a temporary school building at Tirphil; (4) levelling playground, &c., at Tynyrheol Council school, Garw Valley; (5) erecting new latrines at the County school at Pontypridd; (6) erecting a medical inspection room at the Council school at Llanwit Fardre; (7) alterations and additions to the Council school at Cadle, Fforestfach. The County Council Offices, Westgate Street, Cardiff.

Wales.—Feb. 9.—For the erection of a Council school at Llanfair, P.G., for the Anglesey education committee. Mr. J. Owen, F.R.I.B.A., county architect, Menai Bridge.

Wales.—Feb. 10.—For erection of thirty-one houses at Port Talbot, for the Port Talbot Building Club. Messrs. Evans & Jones, architects and surveyors, 5 Station Road, Port Talbot.

Wales.—Feb. 11.—For erection and completion of a farm house at Ashdale, for the Pembrokeshire County Council. Mr. Arthur Thomas, A.R.I.B.A., county surveyor, Haverfordwest.

Wales.—Feb. 16.—For completing the erection of the Siloh Methodist Chapel, Gwauncaegurwen. Mr. Arthur S. Williams, M.S.A., architect, Llandilo.

Wales.—Feb. 28.—For erection of twenty-two houses in three blocks, and six pairs of semi-detached villas, together with the construction of roads, sewers, and surface-water drains, on the Meyrick Estate, Gwaelodygarth Field, Merthyr Tydfil, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

The Birmingham City Council have authorised the education committee to proceed with the erection of a school in St. Benedict's Road, Small Heath, for 1,000 children, at a cost of 16,000*l.*, and with the enlargement of the Council school in Station Road, Harborne, at a cost of 11,500*l.* It was agreed to instruct the finance committee to borrow 11,845*l.* for the erection of a new Council school in Charles Arthur Street, Nechells, and 724*l.* for houses for married officers on the Industrial School Estate, Shustoke.

# TENDERS.

## ASHFORD.

For new Secondary school for the Middlesex County Council. Mr. H. G. Crothall, architect to the education committee.

| | | | |
|---|---|---|---|
| Jordan | £9,752 | 0 | 0 |
| Neal | 9,600 | 0 | 0 |
| Mattock Bros. | 8,630 | 0 | 0 |
| Knight & Son | 8,599 | 0 | 0 |
| Lacey | 8,590 | 0 | 0 |
| Dickens | 8,495 | 0 | 0 |
| Brand, Pettitt & Co. | 8,470 | 0 | 0 |
| Francis | 8,437 | 0 | 0 |
| Treasure & Son | 8,400 | 0 | 0 |
| Try & Hancock | 8,388 | 0 | 0 |
| Renshaw | 8,377 | 0 | 0 |
| Dorey & Co. | 8,344 | 0 | 0 |
| A. & B. Hanson | 8,286 | 0 | 0 |
| Lawrence & Son | 8,248 | 0 | 0 |
| Fairhead & Son (*recommended*) | 7,985 | 0 | 0 |

## BURY.

For additional workhouse accommodation. Mr. Alfred Hopkinson, architect, Bury, Lancs.

| | | | |
|---|---|---|---|
| Barker | £9,630 | 0 | 0 |
| Wilson & Son | 9,596 | 0 | 0 |
| Lomax | 9,592 | 0 | 0 |
| Neil & Sons | 9,386 | 0 | 0 |
| Thompson & Brierley | 9,180 | 0 | 0 |
| Young, Tinker & Young | 9,085 | 0 | 0 |
| S. & J. Smethurst | 8,660 | 0 | 0 |
| Inman & Sons | 8,570 | 0 | 0 |
| Partington | 8,500 | 0 | 0 |
| Tinline | 8,365 | 0 | 0 |
| Byrom, Bury (*accepted*) | 7,987 | 0 | 0 |
| Architect's estimate | 8,907 | 0 | 0 |

## CHELMSFORD.

For erecting an elementary school at Trinity Road, Springfield. Messrs. C. & W. H. Pertwee, architects, Chelmsford.

| | | | |
|---|---|---|---|
| Johnson & Hawkes | £15,633 | 0 | 0 |
| Glascock & Son | 15,620 | 0 | 0 |
| Lawrence & Sons | 15,444 | 0 | 0 |
| Nightingale | 15,260 | 0 | 0 |
| Minter | 15,178 | 0 | 0 |
| Grimwood & Sons | 14,989 | 0 | 0 |
| Youngs & Sons | 14,975 | 0 | 0 |
| J. Smith & Son | 14,945 | 0 | 0 |
| Rayner | 14,925 | 0 | 0 |
| Mason & Son | 14,750 | 0 | 0 |
| Gibson & Sons | 14,546 | 0 | 0 |
| Blake | 14,495 | 0 | 0 |
| Bennett | 14,450 | 0 | 0 |
| Hammond & Son | 14,438 | 0 | 0 |
| H. Smith | 14,311 | 0 | 0 |
| Flint | 14,287 | 0 | 0 |
| Partington & Son | 14,100 | 0 | 0 |
| Henson & Son | 14,040 | 0 | 0 |
| Spencer, Santo & Co. | 14,016 | 0 | 0 |
| Bailey | 13,994 | 0 | 0 |
| Clark & Sons | 13,990 | 0 | 0 |
| Roper | 13,989 | 0 | 0 |
| Weight | 13,800 | 0 | 0 |
| Potter & Son, Chelmsford (*accepted*) | 13,475 | 0 | 0 |

## COUNDON.

For reconstructing Coundon Bridge, for the Durham County Council. Mr. W. Crozier, A.M.I.C.E., county engineer.

| | | | |
|---|---|---|---|
| Bell | £1,167 | 5 | 0 |
| Davison | 1,075 | 13 | 4 |
| Moore | 1,030 | 0 | 0 |
| Walton Bros. | 1,000 | 0 | 0 |
| Sowerby | 850 | 2 | 6 |
| Hilton | 832 | 13 | 0 |
| Lant, Newcastle (*accepted*) | 792 | 12 | 4 |

## DARLINGTON.

For the erection of a girls' high school, for the Durham County Council.

| | | | |
|---|---|---|---|
| Blackett & Son, Darlington (*accepted*) | £12,599 | 0 | 0 |

## DARTFORD.

For erecting a Secondary school for girls, to accommodate 250 children, for the Kent education committee. Mr. W. H. Robinson, M.S.A., architect.

| | | | |
|---|---|---|---|
| Pethick Bros. | £10,999 | 0 | 0 |
| Jarvis & Sons | 10,540 | 0 | 0 |
| Moss & Co. | 9,765 | 0 | 0 |
| Gunning & Sons | 9,642 | 0 | 0 |
| J. & M. Patrick | 9,585 | 0 | 0 |
| Nightingale | 9,480 | 0 | 0 |
| Skinner | 9,392 | 0 | 0 |
| Knight | 9,309 | 0 | 0 |
| Webster & Son | 9,219 | 0 | 0 |
| Wallis | 9,195 | 0 | 0 |
| Spencer, Santo & Co. | 9,186 | 0 | 0 |
| Ingleton | 9,180 | 0 | 0 |
| Lowe & Co. | 9,139 | 0 | 0 |
| Thomas & Edge | 9,100 | 0 | 0 |
| Wallis & Sons | 9,074 | 0 | 0 |
| Foster | 8,998 | 0 | 0 |
| Podger & Son | 8,900 | 0 | 0 |
| Parren & Sons | 8,899 | 0 | 0 |
| Ellingham | 8,840 | 0 | 0 |
| Blay | 8,677 | 0 | 0 |
| Friday & Ling | 8,500 | 0 | 0 |

## FOLKESTONE.

For the extension of a public library on Grace Hill. Mr. A. E. Nichols, borough surveyor. Quantities by Mr. A. E. Nichols, M.I.C.E.

| | | | |
|---|---|---|---|
| Hayward & Paramor, Coolinge, Folkestone (*accepted*) | £3,489 | 0 | 0 |

## FROME.

For new chapel, for the trustees of the United Methodist chapel. Mr. W. S. Skinner, F.R.I.B.A., Bristol.

| | | | |
|---|---|---|---|
| Chown | £1,370 | 0 | 0 |
| Humphries & Son | 1,300 | 0 | 0 |
| Padfeela | 1,261 | 15 | 5 |
| Bird & Son | 1,200 | 0 | 0 |
| Cowlin & Son | 1,190 | 0 | 0 |
| Parsons Bros. | 1,177 | 0 | 0 |
| Foster | 1,175 | 0 | 0 |
| Waters & Son | 1,077 | 0 | 0 |
| Hodder & Sons | 1,000 | 0 | 0 |
| Barnes | 970 | 0 | 0 |
| Bray & Co., Bristol (*accepted*) | 898 | 0 | 0 |

## HARROGATE.

For erection of new wing and other alterations at the Prince of Wales Hotel. Messrs. Richardson & Bell, A.R.I.B.A., architects, Wakefield.

| | | | |
|---|---|---|---|
| Simpson & Sons, Harrogate | £4,935 | 0 | 0 |

## HULL.

For alterations and additions to Wawne Street school. Mr. J. H. Hirst, city architect, Hull.

| | | | |
|---|---|---|---|
| Robinson | £3,426 | 0 | 0 |
| Hull General Builders | 3,226 | 0 | 0 |
| Southern | 3,183 | 2 | 7 |
| Knowles | 3,150 | 0 | 0 |
| Jackson & Son | 3,044 | 14 | 0 |
| Goates & Son | 2,981 | 0 | 0 |
| Quibell, Son & Greenwood | 2,974 | 10 | 0 |
| Levitt | 2,959 | 15 | 4 |
| Fenwick | 2,900 | 0 | 0 |
| Singleton | 2,858 | 0 | 0 |
| Panton | 2,849 | 0 | 0 |
| Harper, Hull (*accepted*) | 2,842 | 0 | 0 |

## JARROW.

For the erection of a Secondary school, for the Durham County Council.

| | | | |
|---|---|---|---|
| Lumsden, Jarrow (*accepted*) | £15,690 | 0 | 0 |

## LAUGHTON.

For erection of new school at Laughton, Yorks, for the Kiveton Park education sub-committee.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Charlesworth, builder | £2,469 | 19 | 0 |
| Boot & Son, joiner | 1,349 | 0 | 0 |
| Rushworth, plumber | 599 | 0 | 0 |
| Wilkinson, plasterer | 229 | 19 | 0 |
| Jagger, painter | 92 | 10 | 0 |

## LONDON.

For the reconstruction of the bridge carrying Mitcham Lane over the London, Brighton and South Coast Railway, in connection with the construction, on the underground conduit system of electric traction, of the tramways from Streatham to Tooting Junction, for the London County Council.

| | | | |
|---|---|---|---|
| Rowlingsons & Co. | £2,245 | 14 | 0 |
| Dick, Kerr & Co. | 2,029 | 6 | 5 |
| Mowlem & Co. | 1,990 | 0 | 0 |
| Muirhead & Co. | 1,892 | 10 | 0 |
| Thorne & Son, Westminster (*recommended*) | 1,843 | 9 | 3 |
| Dinnie | 1,745 | 9 | 8 |
| Chief Engineer's estimate | 1,928 | 0 | 0 |

For erection of a new fire-station in Brunswick Road, Bromley-by-Bow, for the London County Council.

| | | | |
|---|---|---|---|
| Higgs & Hill | £11,974 | 0 | 0 |
| Holloway Bros. | 11,790 | 0 | 0 |
| Smith & Son | 11,769 | 0 | 0 |
| Johnson & Co. | 11,666 | 0 | 0 |
| Holland & Hannen | 11,666 | 0 | 0 |
| F. & T. Thorne | 11,637 | 0 | 0 |
| Leslie & Co. | 11,605 | 0 | 0 |
| Carmichael | 11,570 | 0 | 0 |
| F. & H. F. Higgs | 11,549 | 0 | 0 |
| Kirk & Randall | 11,365 | 0 | 0 |
| Perry & Co. | 11,316 | 0 | 0 |
| Wall | 11,258 | 0 | 0 |
| H. L. Holloway, Deptford (*accepted*) | 11,150 | 0 | 0 |
| Architect's estimate | 11,375 | 0 | 0 |

For alterations to the roof of the waiting hall and relief offices, for the Bethnal Green Board of Guardians.

| | | | |
|---|---|---|---|
| Matlock & Parsons | £393 | 0 | 0 |
| Woollaston & Co. | 347 | 10 | 6 |
| Collins | 323 | 0 | 0 |
| Squire | 320 | 0 | 0 |
| Wood Bros. | 295 | 0 | 0 |
| King | 280 | 0 | 0 |
| Barrett & Parr | 280 | 0 | 0 |
| Rundall | 278 | 10 | 0 |
| Thommason | 274 | 0 | 0 |
| Stapleton & Sons | 264 | 0 | 0 |
| Pike | 240 | 0 | 0 |
| Stokes & Sons, East Ham (*accepted*) | 230 | 0 | 0 |

## NANTWICH.

For erecting new Council schools, Bean Street. Mr. H. H. Brown, architect, Manchester.

| | | | |
|---|---|---|---|
| Stone & Sons | £11,147 | 0 | 0 |
| Young, Tinker & Young | 11,067 | 0 | 0 |
| Matthews | 11,035 | 0 | 0 |
| Neill & Sons | 10,966 | 0 | 0 |
| Cox & Vaughan | 10,698 | 0 | 0 |
| Harding | 10,690 | 0 | 0 |
| Dolan & Son | 10,623 | 0 | 0 |
| Hamilton & Son | 10,558 | 0 | 0 |
| Carlyle | 10,525 | 0 | 0 |
| Brown & Sons | 10,500 | 0 | 0 |
| Birchall Bros., Middlewich (*accepted*) | 10,297 | 0 | 0 |
| Clayton Bros. | 10,102 | 0 | 0 |

## SOUTHALL.

For new cookery and manual training centres and extension of boys' sanitary offices at the Dudley Road and Featherstone Road Council schools, for the Middlesex County Council. Mr. H. G. Crothall, architect to the education committee.

| | | | |
|---|---|---|---|
| Neal | £1,710 | 0 | 0 |
| Knight & Son | 1,545 | 0 | 0 |
| Fassnidge & Son | 1,500 | 0 | 0 |
| Brand, Pettitt & Co. | 1,497 | 0 | 0 |
| Brown | 1,433 | 0 | 0 |
| Dorey & Co. | 1,432 | 0 | 0 |
| Bollom | 1,430 | 0 | 0 |
| Lacey | 1,430 | 0 | 0 |
| Renshaw | 1,425 | 0 | 0 |
| Dickens | 1,422 | 0 | 0 |
| Try & Hancock | 1,398 | 0 | 0 |
| A. & B. Hanson (*recommended*) | 1,349 | 0 | 0 |

### NORTHWICH.

For erection of a Council school in Darwin Street. Mr. W. HEMINGWAY, A.R.I.B.A., architect, Bolton. Quantities by Mr. J. H. HARRIS, Liverpool.

| | | | |
|---|---|---|---|
| WOOD & SONS, Hartford, nr. Norwich (*accepted*) | £5,700 | 0 | 0 |

### SUDBURY.

For extension of the Sudbury Council schools, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | | | |
|---|---|---|---|
| Woodbridge | £3,328 | 0 | 0 |
| Lacey | 3,089 | 0 | 0 |
| J. & J. Bailey | 2,950 | 0 | 0 |
| Batchelor | 2,862 | 0 | 0 |
| Dickens | 2,787 | 0 | 0 |
| Tribe & Co. | 2,723 | 0 | 0 |
| Knight & Son (*recommended*) | 2,569 | 0 | 0 |

### WALES.

For extensions to Wesleyan Sunday schools, Cathays, Cardiff. Mr. H. BUDGEN, F.R.I.B.A., Cardiff.

| | | | |
|---|---|---|---|
| Totterdell | £1,484 | 3 | 0 |
| Gough Bros. | 1,340 | 0 | 0 |
| E. R. Evans & Bros. | 1,298 | 0 | 0 |
| W. H. Evans | 1,296 | 0 | 0 |
| Hallett | 1,270 | 0 | 0 |
| Symonds & Sons | 1,257 | 15 | 0 |
| Davies & Sons | 1,250 | 0 | 0 |
| E. D. W. Evans | 1,249 | 0 | 0 |
| Allan | 1,241 | 0 | 0 |
| Turner & Sons | 1,238 | 0 | 0 |
| Morgan | 1,234 | 0 | 0 |
| KNOX & WELLS, Cardiff (*accepted*) | 1,195 | 0 | 0 |

For extension of water mains in the parish of Llandebie, for the Llandilo-Fawr Rural District Council. Mr. H. HERBERT, C.E., engineer, Ammanford.

| | | | |
|---|---|---|---|
| Evans & Murray | £3,773 | 14 | 0 |
| Jenkins | 3,500 | 0 | 0 |
| Hannie Bros. | 3,169 | 5 | 0 |
| Mercer | 3,075 | 0 | 0 |
| Davies | 3,063 | 3 | 0 |
| POWELL, Whitchurch, near Cardiff (*accepted*) | 2,996 | 0 | 0 |

For alterations and additions to premises in Morgan Street, Pontypridd, for the committee of the Pontypridd and District Club. Messrs. A. O. EVANS, WILLIAMS & EVANS, architects, Pontypridd.

| | | | |
|---|---|---|---|
| Knox & Wells | £1,093 | 0 | 0 |
| Evans & Bros. | 1,019 | 10 | 6 |
| E. Jones | 994 | 0 | 0 |
| Williams & James | 953 | 0 | 0 |
| J. Jones | 930 | 0 | 0 |
| R. Jones | 903 | 1 | 3 |
| SEATON, Pontypridd (*accepted*) | 903 | 0 | 0 |

### WEST HAM.

For the erection of a boys' school and extension of the existing schools. Messrs. NEWMAN & JACQUES, architects, 2 Fen Court, Fenchurch Street, E.C.

| | | | |
|---|---|---|---|
| Webb | £12,859 | 0 | 0 |
| Lawrance & Son | 12,353 | 0 | 0 |
| Lawrence & Son | 11,500 | 0 | 0 |
| Woolaston & Co. | 11,455 | 0 | 0 |
| Coxhead | 11,400 | 0 | 0 |
| Moss | 11,241 | 0 | 0 |
| Symes | 10,997 | 0 | 0 |
| Jerram | 10,876 | 0 | 0 |
| Maddison | 10,550 | 0 | 0 |
| HORSWILL, Forest Gate (*accepted*) | 10,097 | 0 | 0 |

### WOOTTON BASSETT.

For the construction and maintenance of a brickwork tower, 44 feet by 24 feet and 20 feet high, and other works in connection therewith, at Coxstalls, Wootton Bassett. Mr. F. REDMAN, engineer, 34 Wood Street, Swindon, Wilts.

| | | | |
|---|---|---|---|
| Wickstead & Co. | £627 | 15 | 10 |
| Godwin | 606 | 10 | 3 |
| Trow & Son | 585 | 11 | 4 |
| Downing & Rudman | 571 | 0 | 0 |
| Pope Bros. | 557 | 14 | 3 |
| Colborne | 545 | 19 | 3 |
| Kilminster | 538 | 11 | 6 |
| H. & C. Spackman | 531 | 9 | 4 |
| FLEWELLING, Wootton Bassett (*accepted*) | 444 | 16 | 7 |

## TRADE NOTES.

MESSRS. W. POTTS & SONS, clock manufacturers, Leeds and Newcastle-on-Tyne, are now making and fixing new clocks at the Mechanics' Institute, Marsden, Huddersfield; the Hull Garden City, Hull; Bretton Park, Wakefield, for the Right Hon. Lord Allendale; the new secondary school and technical institute, Cleckheaton, and one for near Oldham, Lancs.

A NEW large clock is to be erected in the St. Luke's Hospital, Halifax, Yorkshire, in place of the electric clock, which has been a failure. The contract has been given to Messrs. John Smith & Sons, Midland Clock Works, Derby, who recently made the great clock and chimes for Selby Abbey.

A NEW tower is being built to St. Peter's Church, Macclesfield, which is to be provided with large striking clock with three dials. The order for this has been placed with Messrs. Joyce, clockmakers, of Whitchurch, who are making a similar one for Sir Robert Harvey, Bart., Dundridge, Totnes. They are also fixing one at Thornton-le-Moors Church, Cheshire, and overhauling the clock and carillon and providing new tunes at the Bell Tower, Evesham.

MESSRS. GEORGE MILLS & CO., LTD., engineers, Radcliffe (proprietors of the "Titan" sprinkler), have received intimation that a fire occurred at the very extensive drapery establishment of Messrs. Jardine & Co., Cape Town, South Africa, on the evening of January 9. The fire originated by the fusing of underground electric cable about 20 feet from the building. The flames travelled along the cable into the building and set fire to the drapery stock. One "Titan" sprinkler instantly came into operation and promptly extinguished the fire before the arrival of the Cape Town Fire Brigade.

MESSRS. D. ANDERSON & SON, LTD., London and Belfast, make their "Stoniflex" felt in three varieties. No. 1 is a roofing felt for permanent use; No. 2 is a sarking felt, and No. 3 is a lining felt for insulating cold stores, lining iron buildings, &c. The Stoniflex felt has now been upon the market for ten years, consequently there has been ample time to prove that it is of a most durable and lasting kind, and that it toughens with age instead of becoming brittle. Its pliability prevents its cracking on settlement if stretched tight and smooth. The manufacturers recommend that after the roof has been covered the whole surface should be coated with their "Stoniflex" mastic, as it will not then require any further attention for years. This last is a most important consideration, for there are some felts that require tarring nearly every year. Stoniflex felt has been used for roofing many of the largest factories in the kingdom, schools, football stands and skating rinks all over the country have been covered with it. Another product of Messrs. Anderson & Son, Ltd., is the nut brown wood preservative known as "Sideroleum," which also has been most favourably known to the building trade, architects, and estate agents for many years past. It is laid on direct to dry timber with an ordinary brush, and requires no skill in applying. Another use for it is as a floor stain, when, if beeswaxed and polished, it produces a most excellent effect.

## THE PAINT AND VARNISH SOCIETY.

AT the meeting of the Society to be held at St. Bride's Institute on Thursday, February 10, at 8 P.M., Mr. J. W. Lovibond will contribute a paper on "Colour Nomenclature."

The present unsatisfactory condition of the nomenclature of the colour and paint industry has become more and more apparent in recent years, and considerable attention has been given to the possibility of introducing such methods of definition and standardisation as have been adopted with success in other industries. There can be no doubt that if a satisfactory nomenclature for painters' material could be devised, so that there could be no misunderstanding as to the quality and properties of any article, both manufacturers and consumers would benefit considerably.

Mr. Lovibond's unstinted labour towards this end for many years past is too well recognised for there to be any doubt as to the interest of the paper in question. All who take a practical interest in the matter, favourable or otherwise, are invited to be present at the meeting, and contribute their views and suggestions. Invitation cards will be forwarded on application to the Secretary, Noel Heaton, 11 Stonebridge Park, N.W.

THE Darlington workhouse is to be enlarged at a cost of over 3,000*l*. The additions will consist of new day rooms and dormitories, isolation accommodation and a bakehouse.

## AN ADVERTISING COMPETITION.

However true it may be that a good wine needs no bush, it is certainly not true nowadays that articles of commerce can be safely left to speak for themselves. If it is desired to win for them a very prominent position it is necessary that they should be in some degree pushed forward and a place forced for them among competitors. The same remark applies equally to men and things. But it is in business above all that judicious pushfulness is essential. This advertising or self-advertising must, however, be carried out cleverly to obtain the best results. The merchant has to attract public attention towards his wares before he can sell them. As the public themselves are presumably best able to tell how this is to be achieved, it sometimes happens that an enterprising firm offers a reward for help on the subject. An instance of this recently occurred when Messrs. Thos. Parsons & Sons decided to offer three cash prizes amounting to 50*l*. for a phrase of not more than twelve words suitable for use in advertising their white enamel "Endelline." The sender of the phrase which, in their opinion, was the best was to receive 30*l*.; the second and third in order of merit being awarded 15*l*. and 5*l*. respectively. The competition was open to everybody (employés of Messrs. Parsons excepted) without entrance fee or other restriction whatever.

The competition has proved a complete success. It was only to be expected that after many hours and days spent in the composition of limericks, jaggles and similar intellectual feats the general average ability should be high. But Messrs. Parsons & Sons were able to select three. The first prize of 30*l*. has been awarded to Mr. Chas. Walter Stupart, 112 The Avenue, Bruce Grove, Tottenham, N.; the second prize of 15*l*. to Mr. Thos. Robinson, 79 Rosegrove Lane, Burnley; and the third prize of 5*l*. to Miss B. Thompson, 35 Grand Parade, Cork.

The winning phrases are to become household words through the medium of advertising. It remains to be seen if they rival in graphic terseness the triumphant despatch sent many hundred years ago, "Veni, vidi, vici."

## VARIETIES.

Mr. Butler Wilson, F.R.I.B.A., is delivering a series of lectures on the arts at the Leeds School of Art.

Mr. B. T. Batsford has taken over from Messrs. George Newnes, Ltd., the remaining stock of Mr. Baillie-Scott's volume "Houses and Gardens," and has reduced the selling price from 1*l*. 11*s*. 6*d*. to 18*s*. net.

Whitley St. Helen's Church, in the parish of Slaley, Hexhamshire, is about to be improved and renovated. Slaley Church was also recently improved by the removal of galleries, &c., under the supervision of Mr. A. B. Plummer, F.R.I.B.A., the Newcastle diocesan architect.

The Savoy Hotel, Strand, W.C., is to be enlarged and improved at an estimated cost of over 100,000*l*. The principal work will be the addition of two storeys facing the Thames Embankment and the erection of a banqueting room.

Mr. F. J. Harrison, of Maer Hall, Staffordshire, and Mr. H. Harrison, of Liss, Hants, have given 15,000*l*. for the building and endowment of a church and parsonage for a new parish to be formed out of the parish of Wallasey, Cheshire.

Mr. James Whitehead, of Oldham, contractor, who died December 4, left estate valued at 22,571*l*. gross. The testator left 500*l*. to the vicar and churchwardens of St. Bartholomew's Church, Marsden, towards the erection of a new tower, and 100*l*. each to his book-keeper and his mason.

The London and North-Western Railway Company have had plans prepared for extensive alterations at their Nuneaton station. Part of the scheme is to take down the existing booking hall, offices, refreshment, parcel and waiting rooms, and build an entirely new block nearer the goods station.

Mr. B. Tabberer, F.R.I.B.A., died on the 26th ult. at Alverstoke, Blackheath, at the age of seventy-nine. He was articled to Mr. Henry Goddard, of Leicester, and subsequently commenced practice in London in 1861. In 1870 he was appointed district surveyor for Greenwich, and in 1902 for Deptford East and Greenwich. He was a Fellow of the Surveyors' Institution, and served on the Board of Examiners of the R.I.B.A. for many years. He was a Past President of the District Surveyors' Association, and for twelve years honorary secretary.

The receiving day for architectural drawings intended for the Royal Academy Exhibition, 1910, has been fixed for Thursday, March 24. Not more than three works may be sent by any one artist. Labels and forms can be obtained (during the month of March only) from the Academy. Oil paintings are to be sent in on March 26 and March 29, and sculpture on Wednesday, March 30.

The Liverpool Cathedral executive committee met on Monday. The auditors' statement of accounts for the year showed the expenditure to amount to about 33,000*l*. The sum of 50,000*l*. is still required to complete the portion of the cathedral in course of erection. Designs were submitted for the Bishop's seat in the Lady chapel, and also seats for the clergy, to cost 130*l*. each. Tenders were also submitted for the choir stalls for the Lady chapel at a cost of 465*l*.

The Wolverhampton and District Architectural Association held their annual meeting in the Wolverhampton Library, Waterloo Road, last week. The following officers for the ensuing year were appointed:—Mr. Thomas H. Fleeming, president; Mr. J. Lavender, vice-president; Mr. A. W. Worrall, hon. treasurer; Messrs. F. T. Beck, W. Edwards and W. J. Oliver, members of the Council; and Mr. William J. H. Weller, hon. secretary. The President at the conclusion of the meeting delivered an address.

The following makers of brass steam and water fittings have amalgamated:—Martineau, Beames & Madeley, Ltd., Birmingham; Gaukrodger, Sykes & Roberts, Ltd., Halifax; Newman, Hindes & Co., Ltd., Woodchester; and J. Storey & Sons, Ltd., Manchester. The combination will trade under the style of the United Brassfounders' Engineers, Ltd., and its headquarters will be at Tower Buildings, Liverpool. The object is to enable the different firms to specialise on certain branches and to improve their works organisation so as to meet foreign competition. There is no intention to raise prices, but merely to produce at the lowest possible figure and to fix prices accordingly.

At the annual meeting of the Liverpool Diocesan Church Building Society it was stated that halls and institutes were projected at Seaforth; Christ Church, Kensington; Christ Church, Bootle; St. Paul, Widnes; St. Andrew, Litherland; St. Catherine, Wigan; Newburgh; St. Augustine, Liverpool; St. John the Evangelist, Breck Road; St. Mary, Wavertree; and St. Anne, Stanley. New churches are also about to be commenced at Orrell, Litherland, and in the Hampstead Road for the Welsh; at Abram, at Whelley, and Hoscar; and the Church of Holy Trinity, Wavertree, is to be enlarged and partially rebuilt.

The Durham County Council have adopted the principle that the proposed training college buildings should be in separate blocks as follows:—A. Education block, including assembly hall, lecture and other rooms devoted entirely to educational purposes. B. Hostel accommodation for 120 women students arranged either in three houses for forty students each, or in four houses of thirty each, whichever may be found by the architect to be most economical and convenient in planning. C. Dining hall, kitchens and housekeeper's apartments. D. Gymnasium, &c. E. Sanatorium. F. Laundry. G. Lodge and entrance gates—and that the hostels be planned on the "study bedroom" system. The County Education architect has been requested to prepare the plans for the proposed college, and arrangements are being made to provide him with additional temporary assistance for the purpose.

Mr. W. Erskine, the acting first secretary of the British Embassy at Rome, in a report on the foreign trade of Italy says that the international depression of trade has pressed less severely upon the iron and steel industry in Italy than elsewhere, and is partly due to the support afforded by the Government, whose policy it is to place as many as possible of their orders with local factories. The principal hope for the manufacturing industries of Italy in the future lies in the development—at present almost in its infancy—of the immense hydraulic resources of the Alps and Apennines. Should the problem of utilising the magnificent stores of energy with which nature has endowed this country be attacked with enterprise and science, the cost of production would be enormously reduced, and there should be nothing to prevent her competing on favourable terms in the markets of the world. So long as her manufacturers have to depend upon imported coal for their source of energy they can hope to do little more than cater for the home market with the aid of a high protective tariff.

# THE WARMING AND VENTILATION OF PUBLIC BUILDINGS AND FACTORIES.*

*(Concluded from last week.)*

By T. W. Aldwinckle, F.R.I.B.A.

### *Warming.*

When we come to deal with the methods adopted for warming buildings, we find that these will vary with the system of ventilation. With the simplest form of natural ventilation we have the open fire, that extravagant, much abused, but really cheerful and healthful method. For the rooms only in a public building they are still the most comfortable and wholesome form of warming, and form excellent extraction ventilators, provided always that there are suitable air inlets, such as Tobin's tubes or partially open windows. No system of artificial or mechanical warming and ventilation will ever be as wholesome and comfortable for such a purpose. This refers to single rooms and offices, and not large general offices, where a good number of persons are congregated, and where open fireplaces would be inconvenient and out of place.

Leaving the subject of open fireplaces we come to artificial warming, and the first is direct heating by hot-water or steam radiators, which in some systems of natural ventilation take the place of open fireplaces. Great improvements have in the past few years been made in the various types of radiators, most of the improvements emanating from America; the heating surfaces have been better designed and their efficiency thereby increased. Whenever possible the radiators should be placed against an external wall, so that an air channel can be formed at the back, and in all cases, whether against an inner or outer wall, a baffle should be fixed to the wall immediately above the radiator to prevent the deposit of blacks and dust upon the wall above, caused by the convection air currents set up. Swinging radiators are very convenient for access to the wall for cleaning purposes, but these are somewhat costly. They should, however, always be used for hospital work. It is preferable in all cases for the radiator to stand on wall brackets and not on feet, so as to leave the floor clear for cleansing purposes. The inlet and outlet branches to and from the radiator should each have a valve, in order that any radiator can be removed without disturbing the general circulation.

Exposed or "direct" radiators heat both by radiation and convection, but principally by the latter, and the efficiency of the heating surface is considerably increased by fresh air currents passing across them. The freer the circulation of air round the surfaces of the radiator the higher is the efficiency, and for this reason low radiators are more effective than high ones, and single-column radiators than those with two or three columns. There should therefore be a good air space between the loops. Ribs or other like extensions of the heating surfaces are of little value, at all events in hot-water radiators. It is necessary to paint radiators, and it has been found that bright and glossy paints reduce the amount of radiation, and that a dull, dark paint is preferable. The colour or brightness of the paint does not, however, affect the convected heat. The best position for a direct radiator is under a window, as being the part of the room with the most cold currents of air.

When radiators are used in connection with authorised inlets in an extraction system of ventilation, the incoming air is generally required to have an upward current. It is not a good arrangement to enclose these radiators in iron cases, as there are difficulties in cleaning the interior. It will be sufficient if removable baffles are fitted to the front of the radiator for about two-thirds of its height. This will give the requisite direction of the air.

Wherever radiators are used, whether for direct or indirect heating, the temperature should not exceed 150°, for the reasons already given.

When the warming is in connection with the plenum system, it is not desirable in many cases to make the incoming air the sole source of means of warming, as in most cases this would necessitate undue heating of the air. It is preferable to admit the air at a temperature not exceeding 10° or 15° above the required temperature of the room, and to supplement this by direct heating by means of radiators.

As to the medium to be used for creating the required temperature in the radiators, pipes or batteries, we have live steam, exhaust steam and hot water. High-pressure steam is a costly medium, as its latent heat is less than that of low-pressure steam, and the latter is therefore more generally used. When exhaust steam is available this is still more economical, as it is to some extent frequently a waste product, but this is only available when there is steam power of some kind on the premises. There are two systems of hot-water heating, viz. high pressure and low pressure. The high-pressure system, commonly called Perkin's system, is a sealed circulating apparatus, in which the water is heated to a temperature of 350°, with a pressure of 135 lb. on the square inch. Small pipes are necessarily used. It is a convenient method of heating in some cases, but from our point of view the high temperature of the heating surfaces is a fatal defect. This system is not very generally used in these days. Low-pressure hot-water gravity circulation is very simple and effective, as it supplies its own motive power for the purpose of circulation, and low temperatures can be obtained for the heating surfaces. Low-pressure hot-water gravity circulation is of two kinds, the one-pipe and the two-pipe systems. As its name indicates, the two-pipe system has a flow and return in separate pipes to each circulation, the branch inlet to the radiator leading from the flow pipe, and the outlet leading to the return pipe. In the one-pipe system the inlet and outlet branches from the radiators lead from the same pipe, which is a flow pipe so long as it is feeding the radiators, after which it returns to the boiler. This system is by far the simplest and most effective, and is free from the danger of short circuiting to which the two-pipe system is very liable. As, however, in the one-pipe system, the hot water having done duty in the radiator, returns somewhat cooler to the same flow pipe (and the radiators may be numerous), the tendency is for the water in the flow pipe to become a little cooler, and to meet this difficulty the heating surfaces of the further radiators should be proportionately increased.

Where there are several floors to a building there should be a separate circulation to each floor leading from two large drums, one for the flow and one for the return, these drums being in circulation with the boiler. A valve placed on each flow pipe close to the drum will admit of the necessary regulation of flow, so that one floor shall not get a better circulation than another. In all gravity circulations great care must be taken in the matter of air pipes, otherwise trouble may ensue. The overhead or drop system is practically the one-pipe system with descending instead of ascending branches. It is useful in many positions where the other systems would be unsuitable.

Whatever the system of circulating adopted, one matter should be borne in mind, viz. that any circulating or branch pipe which is not doing duty, either by radiation or convection, should be coated with a good non-conducting composition, so as to prevent loss of heat.

To surmount the difficulties arising to the circulation from dips and other obstacles, and for other good reasons, several ingenious apparatuses have been designed to force the circulation, three of which I will describe. In these cases pipes of smaller diameter can be used. It must, however, always be remembered that these generally require motive power of some kind, to be represented by steam power or electric motors, and that this has to be paid for in annual cost.

In the pulsial system the hot water is circulated compulsorily in continuous pulsations; the water in an ordinary water boiler being brought to boiling point, and rising in a pipe taken from a boiler is converted into steam, which is used for displacing a body of water in two cylindrical vessels, forming part of the apparatus, and placed in a certain relationship to the supply tank. An arrangement of "syphon" pipe in one displacer is used as a cut-off for the steam in such a manner as to cause alternative displacement of water, condensation of steam and consequent refilling of the displacers with water. The whole of the circulating pipes, radiators, boiler and pulsial displacers form one connected open-bore system, under atmospheric pressure. No sunk boiler-room is required, and pipes of small diameter are used. The apparatus is noiseless, and admits of any desired temperature of the circulating water being regulated, from a low temperature to a high one. It will be noted that no independent steam supply is required, the steam used being generated in the apparatus itself.

The cable system is automatic, using very small pipes, and is a self-contained system without pumps, working with a boiler pressure as low as 1½ lb., or with exhaust steam only. The most important part of the apparatus is a thermo-syphoniser, in which condensation of the steam causes a powerful suction on the return pipe, which draws the water round the system at a high velocity. The boiler can be placed at any level, provided it is at a certain minimum distance below the expansion tank, and basement excavation can be thus avoided. The circulating pipes—flow and return—can be run from the apparatus in any direction up or down and at any desired level. The temperature of the circulating water is automatically regulated.

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* A paper read before the Association of Engineers in-Charge on January 12.

The turbo system consists of a turbo accelerator, driven by an electric motor, taking ¼ h.p. for the small and ½ h.p. for all but the larger sizes. It is practically a forced circulation, and thus independent of levels and of dips and other obstacles, and admits of the circulating pipes being small. It can be easily adapted to existing circulations.

There is also the ordinary system of forced circulation, suitable for large hospitals and other institutions where there are several detached buildings on the site. For this purpose there is a central heating chamber, preferably close to the boiler-house, in which the water is heated in large steam heaters, from whence it is pumped along circulating pipes in subways, at a velocity of from 3 to 4 feet per second, to the several buildings, with branch gravity circulations into each building. These forced circulations can with advantage be arranged in the method of ring mains—i.e., two pipes running round the group of buildings and thus forming a ring, each pipe starting from the heater and going in the opposite direction, and then returning to the heater. Each circulation starts as a flow pipe, and runs as such for half the journey, when it becomes a return pipe. Thus a fair equality of flow temperature is maintained throughout the ring. But there is another great advantage arising out of this arrangement. The two rings are connected by cross pieces and three-way valves, so that any part of the system can be shut down for repairs, leaving the whole of the remainder of the system in circulation. Care must be taken to provide a sufficient number of expansion joints in these mains. Exhaust steam from the pumps and engines is used in the heaters, supplemented as may be necessary by low-pressure live steam. It is prudent to have a spare heater and the pumps in duplicate. This arrangement of a central heater chamber is much more convenient than having steam neaters in each building, and saves labour on the part of the staff. I wish to emphasise the importance of having the circulating pumps of ample size, in order that the circulation may be efficient without forcing the pumps. This has not always been done with these installations. This question of a comfortable margin of power equally applies to all other parts of a heating apparatus, whether boilers, circulating pipes or heating surfaces.

As regards steam heating I may mention the Webster vacuum system and the Nuvacuumette system, both of which deal primarily with exhaust steam.

The Webster vacuum system uses exhaust steam, supplemented as occasion may require by live steam. The exhaust pipe from the engine passes through an oil-separator, and is carried through a system of distributing mains to the several radiators, which system can be upward or downward, according to the nature of the building. Each radiator has two valves, the outlet or return end of the radiator having an automatic valve designed to pervent the escape of steam into the return main, while freely permitting the discharge of air and water thereto. The return mains lead to a vacuum pump, having first passed through a suction strainer and condenser head for removing any chips or scale that might otherwise enter the pump. The vacuum pump discharges to an air-separating tank, from which the water passes through a sealed discharge pipe to the feed pump. The speed of the vacuum pump is automatically controlled by a vacuum governor. which can be set to maintain any degree of vacuum in the return mains. Low-pressure live steam can also be used with this apparatus.

The Nuvacuumette system is upon somewhat similar lines, but with one important difference. The automatic valves controlling the steam supply to the radiators are placed on the inlets, but the return or condense outlets from the radiators have no valve and are open to the condense main. Thus the vacuum in the condense main extends into the radiators. the radiators being under the same absolute pressure as the condense main. By this arrangement the temperature of the radiator can be regulated by the vacuum maintained. With the usual vacuum of 10 inches the temperature of the steam would be 193°, and this can be lowered to 170° by increasing the vacuum to 18 inches. Thus a fairly low temperature can be obtained for the heating surfaces, although not so low as in hot water apparatus.

There are many public buildings where no steam is required for any other purpose, and in such cases hot-water heating is preferable, as a hot-water circulating boiler requires very little attention, whereas steam boilers require the skilled attention of an engineer.

On the other hand, in the case of factories where there will be a good deal of steam-driven machinery, the heating medium will generally be steam, as there will be a large quantity of exhaust steam available, for which in many cases there would be no other use. In the case of one-storey factories with roofs on the factory or saw-tooth system, the heating is effected by steam pipes running just below the springing of the roof. This prevents undue cooling of the air by the open roof and glass.

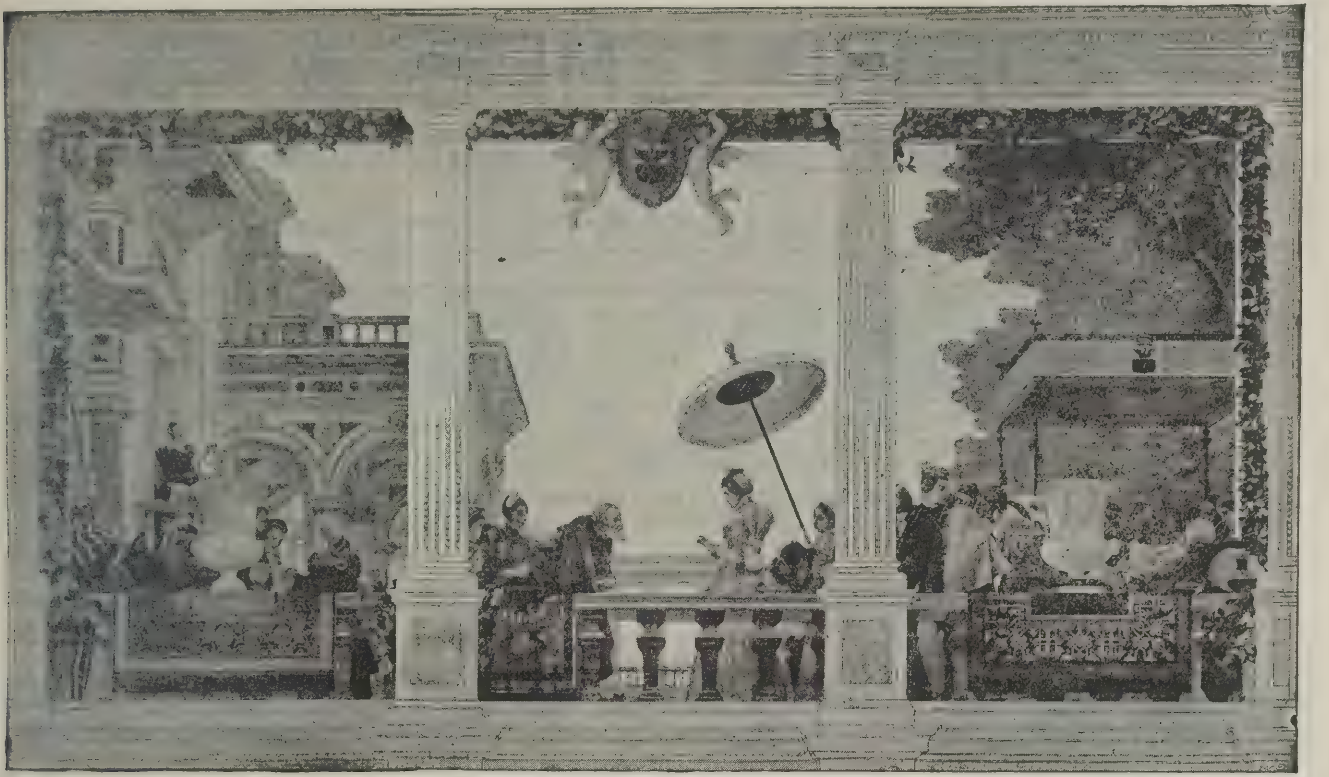
In calculating the necessary amount of heating surface in batteries, radiators or pipes regard must be had to, and allowance must be made for, not only the amount of incoming air which has to be warmed, but also to the loss of heat from walls, windows, ceilings, floors or open roofs; and a further allowance must be made for exposed positions and a northern aspect. Allowance must also be made in those cases where the heating apparatus is closed down during the night, during which period the external walls will have cooled down. The loss of heat from these sources is considerable, and in some cases amounts to almost as many units of heat as are required for the purpose of warming the whole of the incoming air.

It is essential that the amount of heating surface should be such that the building can be quickly warmed in the morning, not only for convenience, but as a matter of economy in fuel. It is cheaper to get the heat up in a building in a short time than to have to continue the process for three or four hours.

In conclusion, I have to point out that the cost of working ventilation and warming apparatus should be considered when they are designed, so as to avoid undue expenditure of power in mechanical ventilation and excessive consumption of fuel in connection with warming apparatus, the latter being a matter of the utmost importance.

At the meeting of the Association of Engineers-in-Charge, on Wednesday, January 12, the following discussion on Mr. Aldwinckle's paper took place. The President (Professor Henry Adams) said his definition of a successful system was one about which no complaints were made, but he had not encountered that system yet. The judge at the Hull County Court had caused some sensation recently by sending for a pole and breaking the windows in order to improve the ventilation, for which he was censured by the Corporation property committee. Similar feelings were being expressed about the ventilation of the Central Criminal Court in London, although something like 40,000*l.* had been spent upon the ventilation system there. The members had inspected this apparatus, and there was every appearance that the Plenum system had been efficiently installed. Dr. Parkes, the founder of the Parkes Museum, had said that ventilation required the study of a lifetime, and he was certainly right. Steam heating, which had been referred to, had the disadvantage of charring the organic particles in the air, but it also had the great advantage of containing a large amount of latent heat, which was converted into sensible heat when the steam condensed. It might not be generally known that if a certain quantity of water required 1,000 heat units to raise it from freezing to boiling point, it required 5,359 additional units to evaporate it, and it was this latter quantity which was given off when the steam condensed. With regard to the Perkin system, he believed the original experiments were carried as high as 1,000 lbs. to the square inch.

Mr. H. Capsey did not agree with the author's ideal for the heating and ventilation of a hospital ward. He would prefer to regard the fireplaces as an alternative means to obtaining warmth with hot water. He deprecated the attempt to work a hot water medium and fires together. Under such a combination, provision was made to abstract the vitiated air as near the ceiling as possible, whilst the fireplaces were doing the same thing on the floor level. Consequently, opposition was set up to the passage of the vitiated air rather than direction being given to it. On the other hand with such a dual arrangement, the fire places might have the effect of diffusing the heated air and prevent short circuiting to the window sashes above, if radiators were placed underneath the windows and ventilators placed above. The author had not referred to pipes as compared with radiators for the heating medium although pipes were generally considered to give a more equal diffusion of the heat. The question of inlets and outlets for the air was an important one. He favoured the louvre type of ventilator, and recom-



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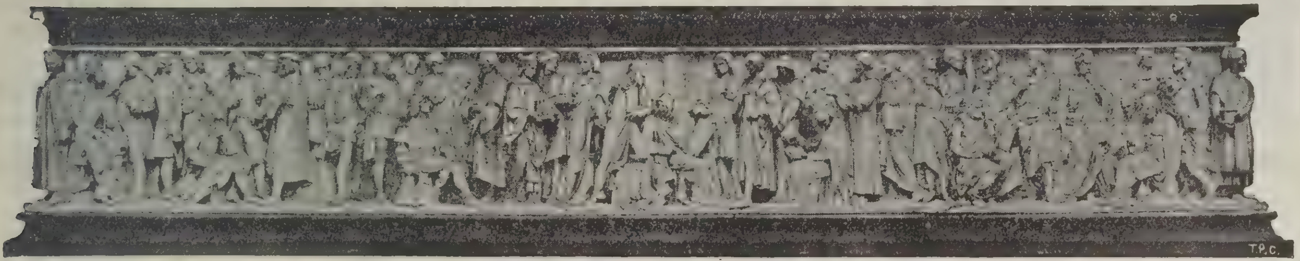

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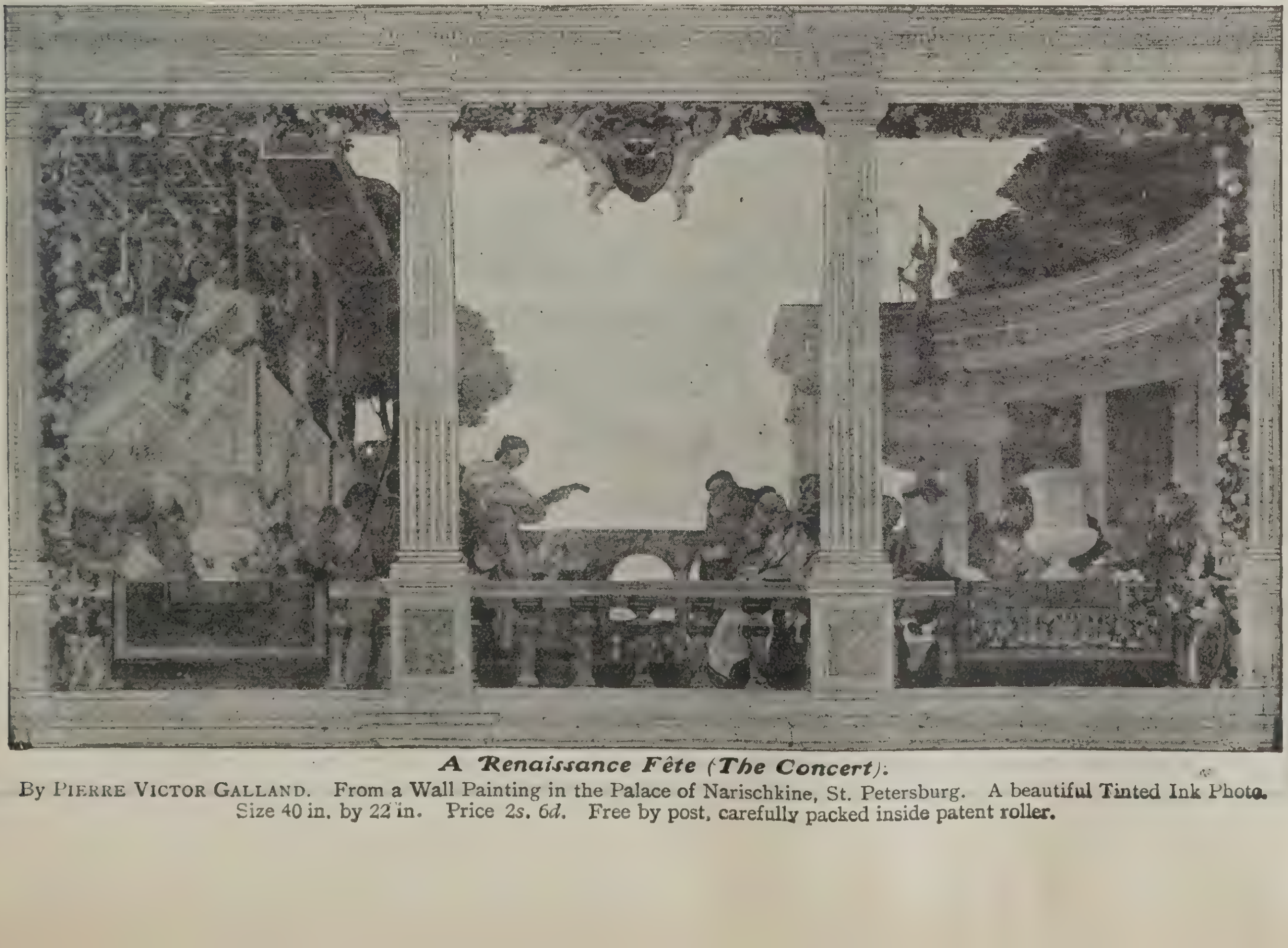

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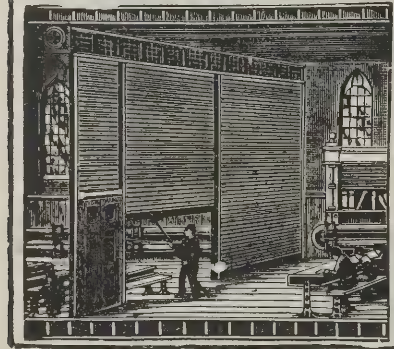

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mended them being turned upwards. Where it could be arranged, he thought a baffle plate should be fitted in front of the opening on two sides only, an inch from the wall, as this tended to direct the air over the heated medium, especially if the latter be represented by pipes. Where particularly large apartments were being heated from a fire or boiler, he thought it was advisable to have independent flow and return mains, if only to avoid throttling down which was usually necessary when there were many branches with varying levels connected to the same main. Throttling down very often impaired the efficiency of the whole system owing to the absence of that rapidity of circulation which was essential in obtaining an even temperature. Another matter which was often overlooked was the necessity for having all branches, &c., properly covered with a view to getting the maximum amount of heat where it was required. In this way a large amount of radiation where it was not required was prevented.

Mr. J. A. Dargue (Messrs. Dargue & Griffiths, Liverpool) said his firm was the first to instal the Pulsial system on a large scale. This system was a positive one, and had the advantage of being able to be regulated. It would also carry practically any distance. In one installation there were six circulation mains, each one mile long, and exhaust steam, supplemented by live steam, was used. The hot water left at about 200° and returned at about 173°. The temperature at the extreme end of the circulation was 62°.

Mr. A. E. Wheeler (Messrs. Z. Berry & Co., Westminster) was pleased to see that the author had struck a different note in his paper to previous papers on this subject. He treated more of ventilation than of heating. He maintained that their first object should be to supply the air, and then take means to heat it to a comfortable temperature in winter. The practice had arisen in the heating profession to lay-off the heating surface as having some proportion to the cube of the building, but it did nothing of the kind. If this practice were followed, it meant that in a place like a picture gallery there was an enormous amount of cubic space and very few people, whereas in a church there would be less heating surface than was required. He disagreed with the author in his advocacy of open fires. The paper spoke of them as being healthful, but overlooked the enormous amount of dirt which they created. Further, when Mr. D. K. Clarke was making experiments for the smoke prevention committee, he found that with an open stove 43 per cent. of the heat was wasted, whereas with a closed stove, which corresponded with a boiler, only 24 per cent. of the heat was wasted. It was said that radiator systems were stuffy. But why was this? It was because of the absurd practice of installing radiators in rooms which were made as air-tight as possible without any satisfactory arrangements for allowing the polluted air to get away. A chimney was an efficient ventilator, and with a radiator in front, it formed a Plenum system.

Mr. Coleman asked for the result of experiences with spraying water upon air. He drew attention to the difference between moist atmosphere and dry atmosphere, and to the need for regulation in admitting air according to the climatic conditions. Sixty degrees with moist air was more uncomfortable than 70° with dry air. He would also like to know whether any difficulty had been experienced in closing down certain radiators under pressure without shutting off the main valve and reducing the pressure in the whole system. Did the shutting off of radiators under pressure produce a hammering? He also asked what was the real difference between a turbo and a forced system.

Mr. Scott hoped that open fires in hospitals would not be done away with. as in his opinion the cheerfulness which they imparted to the patients was as beneficial to them as a large proportion of their medicine, &c. With regard to the limit of height at which to fix heating pipes, he said that in one instance he fixed them 8 feet above the floor level, and others on the floor level, and connected them every 10 feet by vertical pipes. It was in a workroom 30 feet by 40 feet, and in spite of the doors always being opened, there were no draughts.

Mr. H. C. Adams said the Board of Trade had recently issued a report concerning the explosion of the heating tubes at Barton's Home, Suffolk, last year. This was a Perkin system which had been in use for twenty-two years, and had been inspected three times every year in addition to being tested once a year to 1 ton pressure. The pipe burst and killed a child, but the Board of Trade could give no reason why it should have done so. They were small pipes, and as wrought iron was subject to corrosion, perhaps they had become blocked up. The Plenum system was installed some years ago in the Birmingham General Hospital, and this was one of the earliest installations on that system. Very elaborate means were introduced for adding moisture to the air, and he had not heard of any complaints that this had been unsatisfactory. He thought more attention should be given to the ventilation of domestic buildings, offices and small workshops. Natural ventilation was possible with such buildings in the country, but in the London atmosphere it was almost impossible.

Mr. A. E. Penn drew attention to the fact that electric heating and ventilating had not been mentioned in the paper. In the case of the Bath Club they did for 6*l.* what originally cost more by steam. When electric supply companies took the matter up more seriously he thought electricity would prove a strong competitor with steam.

Mr. Maclean thought the reason why the Plenum system sometimes failed was that it was not properly looked after. This system admittedly required considerable attention, and if they desired fresh air then it was worth the extra trouble. With regard to electricity, Professor Carpenter had calculated that it cost from twenty to twenty-eight times as much as steam.

Mr. F. Broadbent, as a consulting electrical engineer, somewhat ridiculed the last statement. Station costs were being rapidly reduced, and in many cases were now below one penny per unit, and he had not the slightest doubt that electricity would soon prove a serious competitor with steam and gas.

Mr. Waldron mentioned the use of a steam jet for forcing hot water through pipes. This required no moving machinery, the whole of the hot steam being held in the water. With regard to forced circulation by means of pumps, they should not forget that pumps worked slowly. If the pump was not fully large enough for the work, then above a certain speed knocking occurred which would be transmitted a tremendous distance through the water in the pipes. He had found centrifugal pumps more satisfactory. This, like the steam jet system which he had mentioned, was noiseless. He concluded by mentioning a Leeds hospital where the engineer in charge varied the quantity of air admitted according to the climatic conditions, with very satisfactory results.

The author having briefly replied, a hearty vote of thanks to him closed the meeting.

## THE TIMBER TRADE IN 1909.

Messrs. Foy, Morgan & Co. state in their annual wood report that from a statistical point of view the past year bears a close resemblance to its predecessor. The importation of sawn and planed wood goods into the United Kingdom has again been on a much reduced scale, although slightly larger than in 1908, while, on the other hand, the consumption, estimated by the usually accepted standards, has continued at the same low level to which it had been reduced in the previous year. Previous records show that recourse must be had to the year 1895 to find any parallel to either of the last two years in respect of the smallness of both import and consumption. In fact, the great development in the wood business which marked the years 1898 to 1903 has been slowly contracting since then, and the volume of trade has followed a descending scale which for the time being puts business back to the footing of 1895.

It will be seen that the import for the past year, although some 70,000 standards in excess of 1908, marks a decline of about 80,000 standards on the figures for 1907, and 300,000 standards on the figures for 1906. Yet despite the reduction in the demand from this country which these figures indicate, a steady advance in the average cost, due partly to the rising cost of production and partly to the increasing competition from the foreign markets, can be traced for some years past, although to some extent disguised by the growing tendency to introduce smaller sizes and inferior qualities in mitigation of rising prices. The opinion was for some time widely held that the import must fall considerably behind even that of the previous year, owing to the admittedly large deficiency in the early supplies from Sweden and Finland, and the subsequent cessation of production through the strike and lock-out in Sweden. The Board of Trade returns down to the end of July gave strong support to this belief by disclosing a considerable shortage in supplies to that point, but during August and September heavy shipments from Russia practically cleared the previous deficiency, and the growing anxiety of the importers to replenish stocks before the close of the navigation led to an increase of supplies during November, which more than accounts for the slight aggregate excess of the whole year. Russia's contribution continues to swell—in 1907 it was 37 per cent., in 1908, 42 per cent. and is now 46 per cent. of the total import, while the net increase of about 90,000 standards from Russia during the past year has proved more than sufficient to counterbalance the shortage from Sweden consequent upon the prolonged labour troubles. It will be found that during the past year the Russian supplies have exceeded the average of the previous five years by 19 per cent., whereas from all other sources a steady decline is shown, including Sweden with 30 per cent., Norway with 20 per cent., and Canada with 12 per cent. below a similar average in the past.

The fluctuations in the import returns at the various outports have been less pronounced than in the previous year, probably because the depression affecting special branches of trade had been fully discounted already. The Irish ports have all taken larger supplies, as might have been expected in order to compensate for the shortage recorded in 1908. On the other hand the Bristol Channel ports, which made little or no reduction in the previous year, now show a diminution of about 10 per cent. London has increased its import by about 5 per cent., while the remaining ports of the United Kingdom would appear to have been satisfied with the reduced scale of supply established in the previous year, there being fewer instances of variation in an upward than in a downward direction.

The result of the past year's trading must have been on the whole profitable to all sections of the trade, whether shippers, importers, or dealers, although the last have not perhaps benefited to the same degree as the former classes owing to the double drawback they have had to fight against—the abnormal slackness of demand in combination with no slight difficulty in procuring supplies, which were often insufficient and nearly always dearer when wanted. The business done in the past year, although confined within narrower limits than formerly, has been on a thoroughly sound basis, with a remarkable absence of bad debts, and is thus a welcome contrast to the series of years of unprofitable trading, culminating in the misfortunes of 1907-8, which had brought merchants in this country almost to the point of despair. The most hopeful feature at present is the check which has been brought about in the paralysing drop in the consumption of wood in this country. For five or six years previously the curve of demand has persistently declined as the great outlets for wood have been closed in succession, first in consequence of the great depression in the building trade, and later through the stagnation in the shipbuilding, engineering, cotton and export trades. Throughout this period the problem has always been to accommodate the importation to the altered conditions, and the explanation of the unprofitable nature of business in recent years must be sought mainly in the difficulties of this adjustment, even after making allowance for the increased competition which ensues when orders grow fewer or smaller. The volume of the import during the past year would seem to give no opening for criticism from this point of view. On the other hand, with regard to consumption, the trade has doubtless seen the worst, and may now expect to participate in the revival which is so confidently foreshadowed in many quarters, although the building trade is proverbially slow to follow the movements in general trade.

The wholesale market opened last January with prices already determined through the large transactions previously concluded with Continental buyers. Another important factor was the admitted shortage in F.C.W. stocks, estimated in Sweden at 100,000 standards and in Finland at 35,000 standards. So that, notwithstanding the depressed outlook, the importers found themselves forced to follow their foreign competitors in order to secure an adequate proportion of the early shipments which the depleted condition of stocks in this country rendered necessary. In adopting this policy at the outset the importers took the right course, and have found their ultimate reward in the continued upward movement of local prices to meet the higher cost of the new supplies as they came along. This has been quite a feature of the year's business. The effect of the sales made during January and February was to establish the market for a certainty. By this time the Swedes had cleared 40 per cent. of their new production, while the Russians, who entered the field later, were even more successful and disposed of more than half, a result attributable to the increasing popularity these stocks enjoy and the moderate prices at which they were marketed. Meanwhile the condition of trade here (and also in Germany, where, in fact, the rise in prices had been originally engineered) continued to be so bad that considerable uneasiness as to the future was from time to time manifested. During March the market became consequently very quiet. Whatever had been purchased for forward delivery had been acquired on the strength of the known diminution in the supplies, and there could be no inducement to extend operations while it was proving such a difficult matter in the depressed condition of trade to raise spot prices to the level of the new import cost, even though stocks had been meanwhile reduced to perhaps the lowest level known in recent times. Some slight stimulus to trade was derived from the demand for rebuilding at Messina. At the beginning of May the position was recognised as having greatly improved, stocks everywhere being depleted to a point previously unknown, while prices strengthened considerably in consequence of the report that "open water" would be three weeks later than usual. Consequently, by the time the new supplies reached this country local prices were already showing a margin of profit on import cost. The period between Easter and Whitsuntide thus served to consolidate prices and to entirely remove any misgivings as to a possible collapse in prices which the stagnation in March had encouraged. Early June witnessed the diffusion of a feeling of quiet optimism under which any balances or supplementary specifications, especially of White Sea stocks, were easily disposed of. Deal sizes in the lower qualities were much sought after, some important re-sales being effected. From Midsummer onwards the trend of prices was continually upwards as the reality of the shortage in supplies became more and more evident, the effect being moreover heightened through the delay in getting delivery owing to the late opening of the navigation. Those merchants who, influenced mainly by the conditions regulating production, bought freely in January, now found their reward in the profitable opening afforded by the market at this juncture; while those who refrained from buying, influenced solely by the shrinkage in retail trade which seemed for a time to find even fuller confirmation during the depression in March-April, experienced afterwards very great difficulty in procuring sufficient stock for their ordinary trade requirements. During July prices of deals and battens rose from 10*s.* to 15*s.* per standard.

The months of August and September will be memorable on account of the strike and lock-out in Sweden, which led to a practical cessation of production in that country for seven or eight weeks. The effects of the strike must dominate the market and inevitably involve an increased cost in wood supplies for a long time to come. Whatever immediate advantage may have accrued to stockholders here and abroad from the fillip thus given to prices in the present and near future, there must remain the detriment caused by an inflated cost at a time when trade, if it is to revive, needs fostering by supplies which are cheap and easily procurable. Scarcely any attempt was made by the importers to cover their requirements during August, the effect of the labour troubles being then only dimly realised, but during September a large business was done greatly to the advantage of Russian and Finnish shippers, who were enabled to clear their autumn stocks with a facility previously unexperienced. Since the strike Swedish shippers have had no great quantity to sell, being mainly occupied in the fulfilment of old contracts, and the ground was thus left free for the Russian shippers to dispose of any balances that remained.

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THE thirty-eighth annual general meeting of the Edinburgh, Leith, and District Building Trades Association was held in the Building Trades' Exchange, 61 Lothian Road, on the 27th ult. Mr. David Wilson, J.P., vice-president, in moving the adoption of the report, referred to the continued dulness in the building trade, but thought that the general indications were that an improvement could be expected in the course of the present year. The Association was never in a better position, either numerically or financially, since its institution. The following office-bearers were elected for the ensuing year:—President, Mr. David Wilson, J.P.; vice-presidents, Messrs. J. Crowe, J. Dennis and S. Slater; secretary and treasurer, Mr. James Cameron, 61 Lothian Road.

THE Glasgow Town Council at their last meeting considered a letter from the Secretary of the Scottish Exhibition, 1911, enclosing a plan of the proposed Industrial Hall. It had been suggested that this building might be so constructed that it could be used as a permanent structure after the exhibition was closed, as there was a great want of hall accommodation for motor and other exhibitions in the city. The architect estimated that the building for the exhibition would cost about 14,000*l.*, but could be erected as a permanent structure for 25,000*l.* The executive are willing to erect the building and hand it over to the Corporation if the latter will pay the difference. The letter was submitted to the parks and finance committees.

THE

# Architect and Contract Reporter.

FRIDAY, FEBRUARY 11, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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**Under no circumstances whatever can the Proprietors of this journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Blyth.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

Leeds.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

March 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

Peterborough.—The local education authority invite competitive designs for erection of a secondary school at Peterborough to accommodate 250 scholars, but allowing for enlargement so as to accommodate 300 scholars. Mr. Walter J. Deacon, clerk to the Authority, Cross Street, Peterborough.

Sheffield.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l.* Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s.* Apply before Feb. 10 to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

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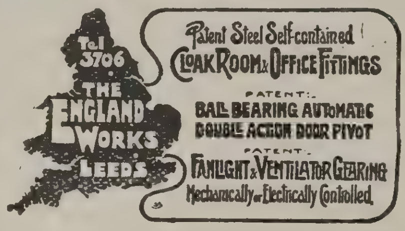

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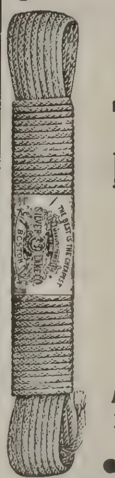

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## CONTRACTS OPEN.

Benington.—Feb. 12.—For the erection of cottage and farm buildings at Benington, Lincs. Deposit 1*l*. 1*s*. Mr. E. J. A. Christie, land agent, Market Place, Boston.

Bingley.—Feb. 18.—The West Riding education committee invite whole or separate tenders for the following:—Bingley: Wilsden provided school, alterations and additions (builder, joiner, slater, plumber, plasterer and painter). The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

Birmingham.—Feb. 18.—For erection of Hockley Hill branch post office. Mr. J. Tosh, H.M. Office of Works, General Post Office, Birmingham.

Blisworth (Northants).—Feb. 15.—For erection of a public elementary school and teacher's house. Send in names by February 15 to Messrs. Brown & Mayor, architects, 80 Abington Street, Northampton.

Bocking.—Feb. 16.—For erection of a new boiler house, sorting room, and other alterations to the existing laundry and kitchen at the Union workhouse, Bocking, Essex, for the Guardians of Braintree Union. Deposit 2*l*. 2*s*. Mr. J. W. Start, F.S.I., architect, Colchester.

Bradfield.—Feb. 18.—The West Riding education committee invite whole or separate tenders for the following:—Bradfield, Loxley New School: builder, joiner, slater, plumber, plasterer and painter. The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

Bradford.—Feb. 12.—For various works required in new conveniences and alterations to class rooms at the following schools, for the Corporation, viz.:—(1) Bowling Back Lane school, (2) Ryan Street school, and (3) Wapping Road school. Mr. Reginald G. Kirkby, A.R.I.B.A., F.S.I., city architect, Town Hall, Bradford.

Buxton.—For alterations to Brunswick House, Hardwick Square. Mr. G. E. Garlick, architect and surveyor, Quadrant Chambers, Buxton.

Canterbury.—For the execution of works in connection with the extension of fire mains, new fire pumps, reservoirs, and other works at the borough asylum. Deposit 5*l*. Messrs. Jennings & Gray, architects, 4 St. Margaret's Street, Canterbury.

Chester.—March 1.—For alterations and additions to public elementary school in Victoria Road. Deposit 1*l*. Mr. Phillip H. Lockwood, architect, St. Werburgh Street, Chester.

Clifford.—Feb. 23.—For carrying out additions and alterations to the Council school at Clifford, near Hay. Deposit 1*l*. 1*s*. The County Surveyor, Shirehall, Hereford.

Coventry.—Feb. 14.—For alterations and additions to workshops at the City Works, comprising one-storey workshop, 95 feet long by 33 feet wide, for the Gas Committee. Deposit 1*l*. 1*s*. Mr. Fletcher W. Stevenson, engineer and general manager, Gasworks, Coventry.

Dartford.—Feb. 28.—For the construction of an open-air swimming bath, for the Urban District Council. The Surveyor, Council Offices, Dartford.

Dawdon (Durham).—Feb. 23.—For the erection of a church at Dawdon, Seaham Harbour (first portion). Mr. C. Hodgson Fowler, F.S.A., architect, The College, Durham.

Distington.—Feb. 21.—For the various works required in erection of shop, warehouse, and dwelling-house at Distington, Cumberland. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

Durham.—Feb. 15.—The County Council invite tenders (1) for the erection of new schools at Usworth Colliery, Castletown, and New Lambton (apply Mr. W. Rushworth, Shire Hall, Durham); and (2) for extensions at Eldon Lane school (apply Mr. F. E. Coates, Shire Hall, Durham).

Earlsheaton.—Feb. 14.—For erection of a villa residence at Bank Top, Earlsheaton, Yorks. Messrs. Barton & Son, architects, Halifax Road, Dewsbury.

Edinburgh.—Feb. 22.—For raising existing car sheds, roofs, &c., at Henderson Row cable power station. Deposit 2*l*. 2*s*. Mr. J. Walker Smith, burgh engineer, City Chambers, Edinburgh.

Golcar.—Feb. 15.—For the erection of two semi-detached residences in Scarhouse Lane. Mr. A. Shaw, architect, Golcar, Yorks.

Great Yarmouth.—Feb. 14.—For erection of fishing premises, South Denes. Mr. Chas. G. Baker, architect, Town Hall Chambers.

Halifax.—Feb. 14.—For the excavator, mason and bricklayer, carpenter and joiner, slater and plasterer, plumber and glazier, and electric lighting in the erection of a detached residence, garage, boundary walls, and other appurtenances at Greenroyd. Mr. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

Handsworth.—Feb. 22.—For the erection of a new station at Handsworth, Birmingham, for the Great Western Railway. The New Works Engineer, Paddington Station, London.

Hazel Grove.—Feb. 22.—For the demolition of certain buildings in Chapel Street, Hazel Grove, near Stockport. The Surveyor, Council Offices, Hazel Grove.

Ireland.—For erection and completion of proposed parochial house, Ballymena, co. Antrim. Messrs. Moore & Flanigan, architects, 35 Royal Avenue, Belfast.

Ireland.—Feb. 14.—For erection of semi-detached villas at the Glen, Londonderry. Deposit 1*l*. 1*s*. Mr. James V. Johnston, A.U.S.A., architect, The Diamond and Butcher Street, Londonderry.

Ireland.—Feb. 19.—For building St. Eugene's Boys' National School, Rosemount, Londonderry, and for plumbing, heating (by low pressure hot water), and electric light fitting at same. Deposit 1*l*. each. Mr. Edward J. Toye, architect, Northern Gate, Londonderry.

Ireland.—March 5.—For proposed works of sanitation and alteration to New Ross union workhouse, comprising the undermentioned:—(1) Drainage and water supply; (2) erection and completion of sanitary annexes, &c.; (3) plumbing and hot water circulation; (4) erection of a new kitchen and annexe at the fever hospital. Mr. J. A. Ryan, architect, 33 Catherine Street, Waterford.

Langley Moor.—Feb. 16.—For erection of cottages at Langley Moor. Mr. J. Turner, secretary, the Brandon and Byshottles Co-operative Society, Ltd., Meadowfield, Brandon, Durham.

Leadgate (Durham).—Feb. 21.—For erection of new stores at Allendale Cottages. The Leadgate Industrial and Provident Society, Ltd., Leadgate, Durham.

Leamington.—Feb. 14.—For pulling down existing cooling room at Royal Leamington Spa, clearing site, and erecting new annexe to the pump room, with basement, for the Corporation. Messrs. Quick & Lee, architects, The Parade.

London.—For building 100 houses of bungalow type on the East Coast. Messrs. Browne & Folkard, surveyors, 117 Victoria Street, S.W.

London.—Feb. 18.—For erection of Putney Telephone Exchange, for the Commissioners of H.M. Works and Public Buildings. Mr. J. Rutherford, H.M. Office of Works, Carlisle Place, S.W.

Longtown.—Feb. 12.—For erection of a dwelling house and outbuildings near Longtown, Cumberland. Mr. C. W. Allan Hodgson, The Courts, Carlisle.

Newburn (Northumberland).—Feb. 28.—For erection of Council offices. Deposit 2*l*. 2*s*. Mr. Edward Cratney, architect, 88 Station Road, Wallsend.

Preston.—Feb. 16.—For erection of weights and measures, billposting offices and workshops, Tithebarn Street. Deposit 1*l*. 1*s*. The Borough Surveyor, Town Hall, Preston.

Radstock.—Feb. 14.—For work in connection with the reconstruction of the offices at the Radstock Council school, Somerset. Mr. W. F. Bird, Midsomer Norton.

St. Dennis.—Feb. 25.—For erection of a dwelling-house and shop at Fore Street, St. Dennis, Cornwall. Mr. B. C. Andrew, M.S.A., architect, Biddick's Court, St. Austell.

Scotland.—Feb. 14.—For mason, joiner, plumber, slater, plaster and painter works required in connection with alterations and additions to Aberchalder Farm House Steading, and new cottage for ploughman, Invergarry Estate. Messrs. L. & J. Falconer, architects, Fort William.

Scotland.—Feb. 22.—For the erection of a new post office at Kelso. Deposit 1*l*. 1*s*. H.M. Office of Works, Parliament Square, Edinburgh.

Scotland.—Feb. 25.—The district committee of the Middle Ward of the County of Lanark are prepared to receive tenders for the erection of buildings to contain refuse destructor; also for steel chimney stack, the provision of water supply and drainage, and the formation of access road and other relative works at Boggs Brae, near Bellshill. Deposit 1*l*. Mr. W. L. Douglass, C.E., district engineer, District Offices, Hamilton.

Seaforth.—Feb. 21.—For erection of the Rawson Road school, Seaforth, near Liverpool, for the Waterloo with Seaforth Urban District Council. Bills of quantities may be obtained from Mr. John I. Thompson, clerk, Town Hall, Waterloo, near Liverpool, upon payment of a deposit of 1*l*. 1*s*. Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Sheffield.—Feb. 19.—For the erection of a rubble stone retaining wall in Chesterfield Road, near Smithy Wood. Deposit 10*s*. The City Engineer, Town Hall, Sheffield.

Sheffield.—Feb. 22.—For extensions and alterations of the Training College for Teachers, Collegiate Crescent. The City Architect, Town Hall, Sheffield.

Southampton.—Feb. 19.—For remodelling the front block of the Carlton Drill Hall buildings. Deposit 1*l*. 1*s*. The Architect, 9 Portland Street, Southampton.

South Shields.—Feb. 14.—For the formation of the forecourt of the Municipal buildings. Apply to the Town Clerk, or to Mr. E. E. Fetch, A.R.I.B.A., 20 John Street, Adelphi, London, W.C.

Swindon.—Feb. 15.—For the building of a stone-breaking yard at the workhouse, Stratton St. Margaret. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

Thorne.—Feb. 23.—For alterations and additions to the workhouse infirmary. Mr. Harold Forster, architect, North Field, Thorne, Yorks.

Wales.—For new American roller rink, Pontardawe. Messrs. C. S. Thomas, Meager & Jones, architects, Salisbury Chambers, Wind Street, Swansea.

Wales.—Feb. 11.—For erection and completion of a farm house at Ashdale, for the Pembrokeshire County Council. Mr. Arthur Thomas, A.R.I.B.A., county surveyor, Haverfordwest.

Wales.—Feb. 14.—For new post office at Porthcawl. Deposit 1*l*. 1*s*. Mr. John H. Phillips, F.R.I.B.A., 7 Pembroke Terrace, Cardiff.

Wales.—Feb. 14.—For alterations and work at the Dorothy Restaurant, John Street, Porthcawl, for the Young Men's Christian Association. Mr. D. J. Rees, secretary, Brynderwen, South Road, Porthcawl.

Wales.—Feb. 14.—For erection of a cottage, stabling, walling, &c., near the lower end of the Gurnos Road, Cyfarthfa Park, Merthyr Tydfil. The Borough Engineer, Town Hall, Merthyr Tydfil.

Wales.—Feb. 15.—For erection of a new hotel at Nantyfyllon, Maesteg. Deposit 1*l*. 1*s*. Messrs. Cook & Edwards, MM.S.A., architects, Masonic Buildings, Bridgend.

Wales.—Feb. 16.—For completing the erection of the Siloh Methodist Chapel, Gwauncaegurwen. Mr. Arthur S. Williams, M.S.A., architect, Llandilo.

Wales.—Feb. 23.—For the construction of a swimming bath at the South Wales and Monmouthshire Truant School, Merthyr Tydfil. Mr. C. M. Davies, architect, High Street, Merthyr.

Wales.—Feb. 23.—The Glamorgan County Territorial Force Association invite tenders (*a*) for proposed gun sheds and stores in Dumfries Place, Cardiff, and (*b*) for extensive repairs at the Drill Hall Buildings. Deposit 1*l*. 1*s*. each. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wales.—Feb. 28.—For erection of twenty-two houses in three blocks, and six pairs of semi-detached villas, together with the construction of roads, sewers, and surface-water drains, on the Meyrick Estate, Gwaelodygarth Field, Merthyr Tydfil, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wednesfield.—Feb. 15.—For the erection and completion of a Council school for 412 infants, and a cookery room, at Lichfield Road, Wednesfield, Staffordshire. Deposit 1*l*. 1*s*. Apply by Feb. 15 to Mr. Graham Balfour, Director of Education, County Education Offices Stafford.

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The Institution of Heating and Ventilating Engineers will hold their annual meeting on the 15th inst., at the Trocadero Restaurant, W., at 2.30. The presidential address will be delivered by Mr. C. Ingham Haden, and a paper will be read on "The Regulation of Heat by Control of Steam Pressure," by Mr. A. H. Barker, B.A., B.Sc.

Mr. Robert Walker, J.P., M.S.A., A.M.I.C.E., died recently at his residence, 17 South Mall, Cork, at the age of seventy-five. Mr. Walker joined the Society of Architects in 1886, two years after its foundation, and served as president for four years, receiving the gold medal in 1897. He was an enthusiastic advocate of registration.

From the Central Lending Library at Nottingham there have been issued from time to time special lists of technical books which may be there obtained. The fifth deals with the building, furnishing and decorative trades, and costs a halfpenny. Such classified lists are to be welcomed, and might be more generally issued from the principal public libraries of the provinces.

# TENDERS.

## BRISTOL.

For alterations and additions to Burfield House, at Westbury-on-Trym, Bristol, and the erection of the Red Maids school, for the Governors. Mr. Frank W. Wills, F.R.I.B.A., architect, Bristol.

| | | | |
|---|---|---|---|
| Perkins & Son | £11,500 | 0 | 0 |
| Cowlin & Son | 11,490 | 0 | 0 |
| Hayes & Son | 11,359 | 0 | 0 |
| Ridd & Son | 11,347 | 0 | 0 |
| Love | 11,227 | 0 | 0 |
| Clark & Son | 11,188 | 0 | 0 |
| Thomas & Son | 11,140 | 0 | 0 |
| Chown | 11,111 | 0 | 0 |
| Humphreys | 10,890 | 0 | 0 |
| Martin & Son | 10,849 | 0 | 0 |
| Walters & Son | 10,567 | 0 | 0 |
| Dowling | 10,478 | 0 | 0 |
| Gluyas | 10,400 | 0 | 0 |
| Wilkins & Son | 10,384 | 0 | 0 |
| Stephens, Bastow & Co., Montpelier, Bristol (*accepted*) | 10,372 | 0 | 0 |

## BEAUDESERT.

For water supply and fire protection works at Beaudesert, Staffordshire, for the Marquis of Anglesey. Messrs. G. & F. W. Hodson, M.Inst.C.E., Loughborough.

| | | | |
|---|---|---|---|
| Lawson & Son | £3,457 | 0 | 0 |
| Nunn & Co. | 2,770 | 0 | 0 |
| Ashley | 2,750 | 0 | 0 |
| Hodges | 2,394 | 0 | 0 |
| Moss & Sons | 2,349 | 0 | 0 |
| Chamberlain | 2,345 | 0 | 0 |
| Lowe & Sons | 2,334 | 0 | 0 |
| Cunliffe & Co. | 2,293 | 0 | 0 |
| Kershaw & Sons | 2,190 | 0 | 0 |
| Law, Kidderminster (*accepted*) | 2,169 | 0 | 0 |

## CHATHAM.

For the erection of balconies at the Workhouse infirmary. Mr. E. J. Hammond, architect, Gillingham.

| | | | |
|---|---|---|---|
| Wenham & Walters | £789 | 0 | 0 |
| H. A. Phillips | 785 | 0 | 0 |
| Baker & Son | 774 | 0 | 0 |
| H. E. Phillips | 755 | 0 | 0 |
| West Bros. | 739 | 0 | 0 |
| Gates & Sons | 725 | 0 | 0 |
| Webb | 720 | 0 | 0 |
| Tong | 670 | 0 | 0 |
| Leech & Co., Chatham (*accepted*) | 629 | 0 | 0 |

## EXETER.

For alterations and additions to No. 1 Higher Summerlands, for the Guardians. Mr. R. M. Challice, architect, Exeter.

| | | | |
|---|---|---|---|
| Westcott, Austin & White | £577 | 0 | 0 |
| Ham & Passmore | 550 | 0 | 0 |
| Sleeman, Exeter (*accepted*) | 497 | 10 | 0 |

## EXMINSTER.

For the construction of about 1,340 yards of 7-inch and 8-inch earthenware pipe sewers, also about 1,322 yards of iron pipe sewers ranging from 6 inches to 8 inches, with the necessary manholes, tanks, filters, and the laying out of a sewerage irrigation area and other works in the parish of Exminster, Devon, for the St. Thomas Rural District Council. Mr. Sidney R. Lowcock, engineer, 50 Queen Anne's Gate, Westminster, S.W.

| | | | |
|---|---|---|---|
| Shaddock | £6,291 | 8 | 11 |
| Furse & Son | 5,761 | 9 | 2 |
| Shellabear & Sons | 5,524 | 17 | 7 |
| Pethick Bros. | 4,971 | 0 | 0 |
| Crockerell | 4,705 | 0 | 0 |
| Catley | 4,700 | 0 | 0 |
| Brebner & Co. | 4,600 | 0 | 0 |
| Pollard & Son | 4,591 | 15 | 9 |
| Burch | 4,547 | 7 | 3 |
| Osenton | 4,435 | 0 | 0 |
| Wickstead & Co. | 4,431 | 3 | 3 |
| Woodman & Son | 4,387 | 0 | 0 |
| Harris | 4,378 | 0 | 0 |
| Ward & Tetley | 4,350 | 3 | 0 |
| Steer & Pearce | 4,280 | 10 | 6 |
| Pike | 4,250 | 0 | 0 |
| Coles | 4,182 | 19 | 9 |
| Pulman | 3,706 | 11 | 6 |
| Stephens & Son, Exeter (*accepted*) | 3,499 | 0 | 0 |

## EXMOUTH.

For the erection of a post office and block of shops. Mr. ERNEST R. ELLIS, architect, Exmouth.

| | | | |
|---|---|---|---|
| Yeo & Sons | £5,798 | 0 | 0 |
| Stephens & Bastow | 5,792 | 0 | 0 |
| Jay-Lang | 5,780 | 0 | 0 |
| Lacey | 5,250 | 0 | 0 |
| Wilkins | 4,775 | 0 | 0 |
| Brealy | 4,668 | 0 | 0 |
| Cooper & Sons | 4,390 | 0 | 0 |
| HAYMAN, Exmouth (*accepted*) | 4,322 | 0 | 0 |
| Gluvas | 4,300 | 0 | 0 |

## LEIGH-ON-SEA.

For the making-up and completion of Grange Road. Mr. JOHN W LIVERSEDGE, A.M.I.C.E., surveyor.

| | | | |
|---|---|---|---|
| Truman | £1,998 | 11 | 5 |
| Ivy Bros. | 1,915 | 4 | 1 |
| Swaker | 1,824 | 10 | 0 |
| Parsons & Parsons | 1,724 | 1 | 5 |
| Jackson | 1,716 | 18 | 1 |
| Buxton | 1,655 | 13 | 6 |
| ILES, Southend-on-Sea (*accepted*) | 1,610 | 0 | 0 |
| Surveyor's estimate | 1,580 | 14 | 10 |

## LONDON.

For new street works, Egerton Road, Hackney, for the Borough Council.

*Norwegian granite.*

| | | | |
|---|---|---|---|
| Griffiths & Co. | £1,810 | 6 | 10 |
| Porter | 1,790 | 18 | 2 |
| Bloomfield | 1,789 | 16 | 0 |
| Catley | 1,764 | 8 | 4 |
| Anderson | 1,754 | 17 | 3 |
| Adams | 1,751 | 9 | 5 |

*Cornish granite.*

| | | | |
|---|---|---|---|
| Griffiths & Co. | 1,788 | 10 | 2 |
| Bloomfield | 1,778 | 6 | 0 |
| Porter | 1,773 | 13 | 2 |
| Anderson | 1,739 | 17 | 3 |
| Catley | 1,738 | 8 | 4 |
| Adams | 1,736 | 9 | 5 |

*Irish granite.*

| | | | |
|---|---|---|---|
| Griffiths & Co. | 1,814 | 3 | 6 |
| Porter | 1,802 | 8 | 2 |
| Catley | 1,794 | 8 | 4 |
| Bloomfield | 1,778 | 16 | 0 |
| Anderson | 1,744 | 17 | 3 |
| Adams | 1,736 | 9 | 5 |

*Guernsey granite.*

| | | | |
|---|---|---|---|
| Griffiths & Co. | 1,803 | 13 | 6 |
| Porter | 1,793 | 5 | 8 |
| Bloomfield | 1,781 | 16 | 0 |
| Anderson | 1,756 | 17 | 3 |
| CATLEY, 23 Lloyd Square, W.C. (*accepted*) | 1,736 | 8 | 4 |

*Leicestershire granite.*

| | | | |
|---|---|---|---|
| Porter | 1,798 | 11 | 6 |
| Catley | 1,794 | 8 | 4 |
| Bloomfield | 1,789 | 16 | 0 |

For the provision of conveniences for men at Plumstead Common.

| | | | |
|---|---|---|---|
| Bickerton | £233 | 10 | 0 |
| J. & C. Bowyer | 232 | 0 | 0 |
| Lowe & Co. | 228 | 0 | 0 |
| Harding & Son | 224 | 10 | 0 |
| Kirk & Randall | 193 | 0 | 0 |
| Hyde & Co. | 170 | 0 | 0 |
| F. & G. Foster | 166 | 10 | 0 |
| A. & F. Polden | 166 | 5 | 0 |
| Line, 81 Peckham Rye, S.E. (*recommended*) | 148 | 0 | 0 |
| Sycamore Works | 97 | 0 | 0 |
| Estimate | 190 | 0 | 0 |

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the construction, on the underground conduit system of electric traction, of the authorised tramways from Brockley Road to Forest Hill.

| | | | |
|---|---|---|---|
| Coles | £54,275 | 8 | 6 |
| Manders | 45,428 | 11 | 9 |
| Kirk & Randall | 41,804 | 0 | 0 |
| Dick, Kerr & Co. | 41,748 | 16 | 9 |
| Mowlem & Co., Westminster (*recommended*) | 39,792 | 0 | 0 |
| Chief engineer's estimate | 42,607 | 1 | 2 |

## LONDON—*continued.*

For providing and fixing two boilers and extending the low pressure hot-water heating apparatus at the Essendine Road school, Paddington, for the L.C.C.

| | | | |
|---|---|---|---|
| Brock | £825 | 0 | 0 |
| Stevens & Sons | 655 | 0 | 0 |
| Turner & Co. | 650 | 0 | 0 |
| Burroughes & Sons | 620 | 0 | 0 |
| Cash & Co. | 564 | 0 | 0 |
| Cannon & Hefford | 561 | 0 | 0 |
| Brightside Foundry and Engineering Co. | 549 | 0 | 0 |
| Cannon & Sons | 545 | 0 | 0 |
| R. H. & J. Pearson | 544 | 0 | 0 |
| G. & E. Bradley, Lever Street, E.C. (*recommended*) | 533 | 0 | 0 |
| Architect's estimate | 552 | 0 | 0 |

For erection of a temporary iron building at the rear of the premises of the London County Council Camden School of Art, Islington.

| | | | |
|---|---|---|---|
| Humphreys | £667 | 0 | 0 |
| Harrison & Co. | 657 | 0 | 0 |
| McManus | 590 | 0 | 0 |
| Harbrow, South Bermondsey Station (*recommended*) | 567 | 0 | 0 |
| Architect's revised estimate | 560 | 0 | 0 |

For the formation of a playground for the girls' and infants' departments at the William Street school, Fulham, by the incorporation of additional land, and the erection of new offices and a playshed.

| | | | |
|---|---|---|---|
| Finch & Co. | £962 | 0 | 0 |
| Bendon | 837 | 0 | 0 |
| Chinchen & Co. | 798 | 0 | 0 |
| Neal | 760 | 0 | 0 |
| Roberts & Co. | 740 | 0 | 0 |
| J. & W. Drake | 693 | 0 | 0 |
| Garrett & Son | 672 | 0 | 0 |
| Lole & Co. | 666 | 0 | 0 |
| Triggs, Clapham (*recommended*) | 644 | 0 | 0 |
| Architect's estimate | 750 | 0 | 0 |

## MINSTER-IN-SHEPPEY.

For the erection of Halfway Houses Council school to accommodate 100 children, for the Kent Education Committee. Mr. W. H. ROBINSON, M.S.A., committee's architect.

| | | | |
|---|---|---|---|
| West Bros. | £1,539 | 0 | 0 |
| Wise | 1,500 | 0 | 0 |
| Gates & Sons | 1,389 | 0 | 0 |
| Seager | 1,379 | 0 | 0 |
| Wallis & Sons | 1,377 | 0 | 0 |
| Browning | 1,360 | 0 | 0 |
| Ingleton | 1,327 | 0 | 0 |
| W. & L. Bowes | 1,319 | 0 | 0 |
| Davison | 1,300 | 0 | 0 |
| Hancock & Kettle | 1,299 | 0 | 0 |
| Kemp Bros. | 1,298 | 0 | 0 |
| Monk | 1,276 | 0 | 0 |
| Norris | 1,274 | 0 | 0 |
| Owen | 1,250 | 0 | 0 |
| Baker & Son | 1,233 | 0 | 0 |
| Skinner | 1,226 | 0 | 0 |
| BISHOP & SONS, Sittingbourne (*accepted*) | 1,212 | 0 | 0 |

## PORTSMOUTH.

For additions to the boys' secondary school, Victoria Road North, Southsea. Mr. A. H. BONE, architect, Portsmouth.

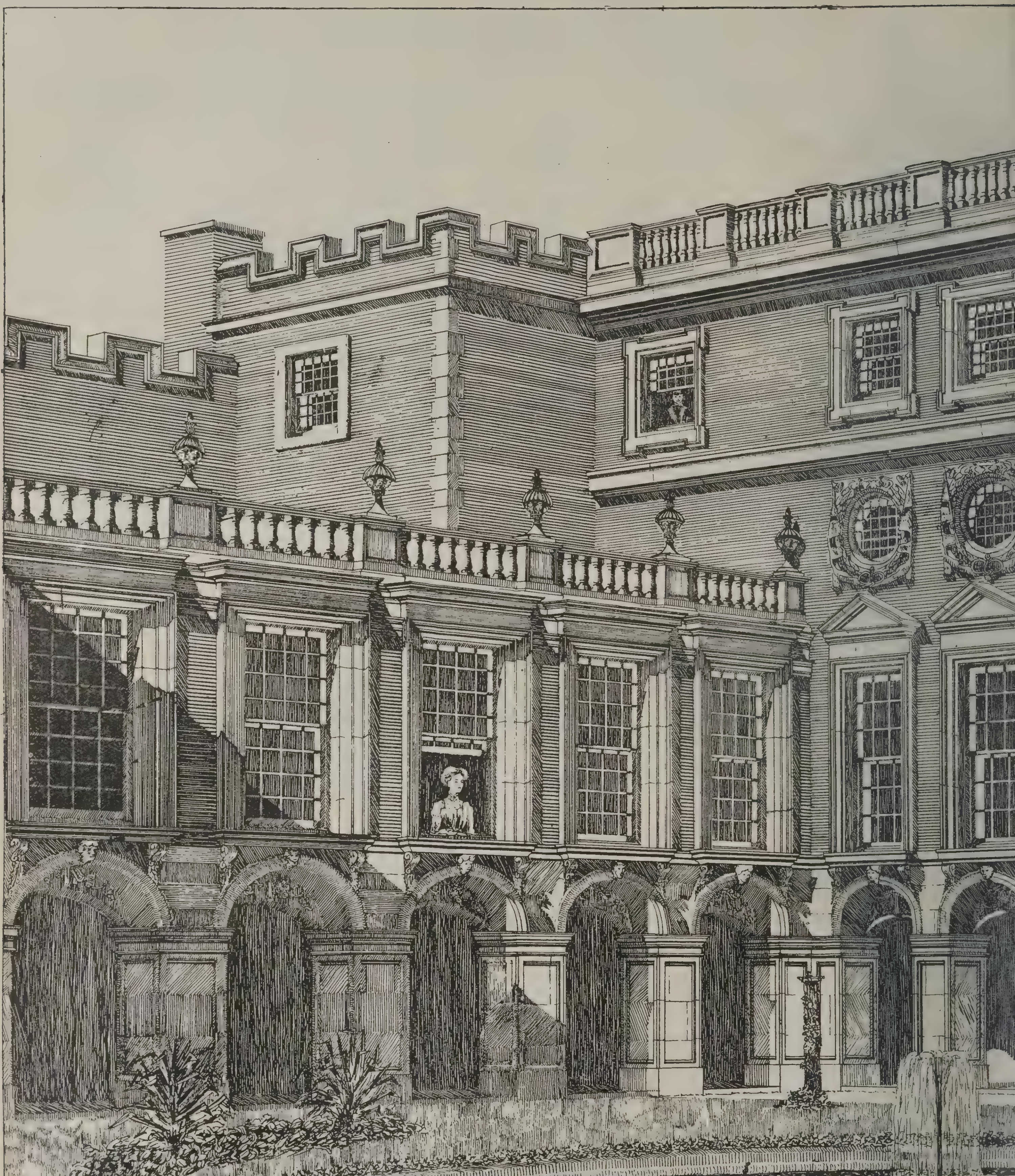
| | | | |
|---|---|---|---|
| Payne | £9,550 | 3 | 0 |
| Barnes | 7,399 | 0 | 0 |
| Privett | 6,849 | 0 | 0 |
| Wakeham Bros. | 6,782 | 0 | 0 |
| Croad | 6,700 | 0 | 0 |
| Tanner | 6,593 | 0 | 0 |
| Say & Co. | 6,488 | 0 | 0 |
| Saunders & Co. | 6,436 | 0 | 0 |
| Crockerell | 6,391 | 0 | 0 |
| Salter | 6,221 | 0 | 0 |
| JONES & SON, Southsea (*accepted*) | 6,176 | 0 | 0 |

## SHREWSBURY.

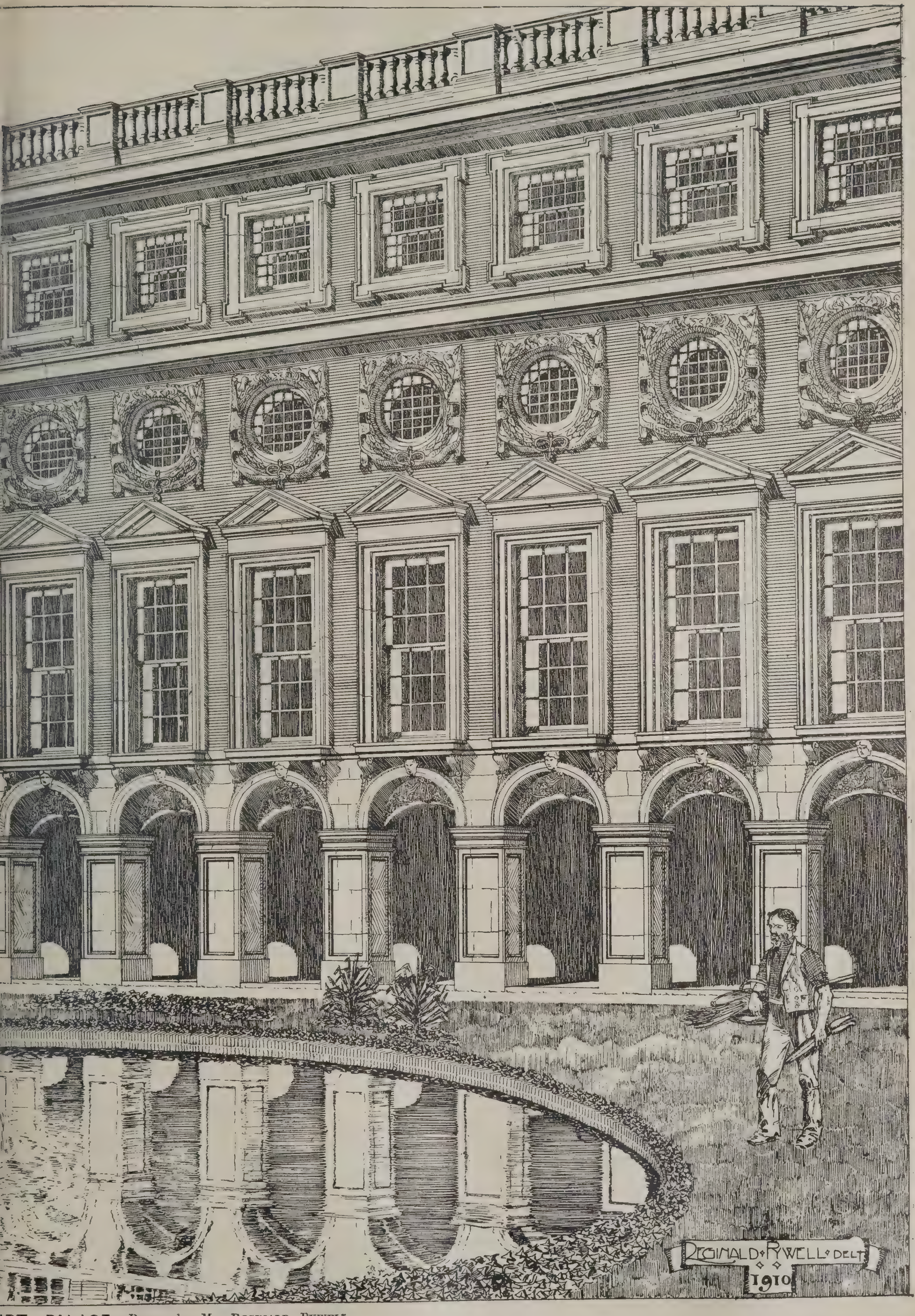
For alterations and additions to Vaughan's Mansion, College Hill. Mr. A. E. WILLIAMS, architect, Shrewsbury.

| | | | |
|---|---|---|---|
| Bowdler & Co. | £1,280 | 0 | 0 |
| Bickerton | 1,250 | 0 | 0 |
| Morris & Sons | 1,220 | 0 | 0 |
| Pritchard | 1,161 | 15 | 0 |
| PACE (*accepted*) | 1,160 | 0 | 0 |

"THE ARCHITECT" STUDENTS'



THE FOUNTAIN COURT, HAMPTON



URT PALACE.—Drawn by Mr. REGINALD PYWELL.

## SOUTHAMPTON.

For erecting a warehouse, stables, and house, &c., Sandhurst Road, Terrace House Estate. Mr. W. H. Masters, architect, 8 Arthur Road, Southampton. Quantities by architect.

| | | | | | | |
|---|---|---|---|---|---|---|
| Jerram . . . . . | £4,229 | 7 | 0 | £3,675 | 17 | 0 |
| Golding & Ansell . . | 4,100 | 0 | 0 | 3,600 | 0 | 0 |
| Buck . . . . . . | 4,029 | 9 | 0 | 3,535 | 0 | 0 |
| Fussell . . . . . | 3,984 | 4 | 5 | 3,522 | 8 | 10 |
| Grace . . . . . | 3,924 | 10 | 0 | 3,560 | 0 | 0 |
| Hood . . . . . . | 3,831 | 14 | 8 | 3,398 | 14 | 7 |
| Stevens & Co. . . . | 3,780 | 0 | 0 | 3,350 | 0 | 0 |
| Exors. of W. Franklin . | 3,761 | 0 | 0 | 3,327 | 0 | 0 |
| Nicol . . . . . . | 3,743 | 0 | 0 | 3,244 | 0 | 0 |
| Jukes & Son . . . | 3,723 | 0 | 0 | 3,275 | 0 | 0 |
| Dyer & Son . . . | 3,616 | 0 | 0 | 3,190 | 0 | 0 |
| Jenkins & Son . . . | 3,564 | 0 | 0 | 3,147 | 0 | 0 |
| Othen . . . . . | 3,422 | 10 | 6 | 3,002 | 15 | 6 |
| Hale . . . . . . | 3,396 | 7 | 0 | 2,965 | 16 | 6 |
| Douglas . . . . . | 3,373 | 0 | 0 | 2,955 | 0 | 0 |
| Saunders & Co. (*accepted*)* | 3,333 | 0 | 0* | 2,920 | 0 | 0 |

## TRADE NOTES.

The prospectus has been issued of The Oil and Ozokerite Company, Ltd., with a share capital of 1,450,000*l.*, divided into 950,000 cumulative 7 per cent. participating preference shares, and 500,000 ordinary shares. The issue advertised is of the preference shares, and of 800,000*l.* 6 per cent. first debenture bonds, both being offered for subscription at par. The company has been formed to acquire and work two mines of ozokerite (a natural petroleum wax which is the best substitute for beeswax), as well as petroleum territories situated on the Tustanowice Oil Fields—the richest petroleum district in Galicia, Austria-Hungary. The subscription list will be closed for town to-night, and for the country and the continent on Saturday.

The trade and commerce committee of the Newcastle Corporation recommend the City Council to purchase a crane, to be erected on the Newcastle quay, at a cost of a little over 1,300*l.*

Mr. Walter Yates, President of the Institution of Heating and Ventilating Engineers, has issued an appeal for support to the heating and ventilating section of the approaching Japan-British Exhibition to be held at Shepherd's Bush. The Japanese Government and people are, he says, keenly interested in all matters connected with heating and ventilation, and are anxious to know where the most perfect appliances can be obtained.

The (U.K.) Winget Concrete Machine Co., Ltd., of 5 Star Chambers, Newcastle-on-Tyne, have just received from one of H.M. Government departments a further order for another "Winget" concrete machine, complete with ordinary outfit, pallets, &c. There could be no more convincing proof of the merit of these machines than the significant fact that Government departments are giving repeat orders for them.

Messrs. Bayliss, Jones & Bayliss, Ltd., were the unfortunate victims of a disastrous fire, which occurred on Saturday night last at their Victoria Works in Wolverhampton. The fire broke out in the large electrical power station, and the entire building was destroyed, together with the very valuable plant. Messrs. Bayliss, Jones & Bayliss have, they inform us, been fortunately able to arrange for a large and immediate supply of electric energy which will enable them to resume work at the end of the current week. It is eloquent of the firm's determination and skill to find that within seven days of a fire involving a loss of many thousands of pounds they are able to announce themselves in a position to take any and every order for their class of goods.

A piquant American calendar issued from the Stanley Works, New Britain, Conn., reaches us through Messrs. Wm. E. Peck & Co., 31 Bartholomew Close, E.C., their London agents. All the productions of the Stanley Works enjoy a high reputation in the United States, more especially their wrought, bronze, and steel butts, and their hinges with and without ball bearings. This fact, however, is scarcely emphasised in the hanging calendar, which is chiefly conspicuous for a charming reproduction in colours of "The Mischief Maker." The light-hearted picture should bring relief to many a jaded mind; it shows a vivacious maiden with a peacock's feather in her hand, snuggling down on a couch, and laughing at the mischief she has wrought. As a specimen of colour printing the calendar merits high praise. Messrs. Wm. E. Peck & Co. are favourably known to architects through the H. & C. wrought steel "Louvre" ventilators.

## CORRESPONDENCE.

### Reinforced Brickwork Tests.

Sir,—Mr. Brown's attention has been called to an article on page 16 of your issue of January 28, reviewing a reinforced brick pier test. I have been instructed to write and point out that this reinforcing mesh, manufactured by Messrs. Johnson, Clapham & Morris, is made under licence from Mr. W. H. Brown, patentee of mesh reinforcement for brickwork.

I shall be glad if you will notify this fact in your next issue.

You will see by enclosed leaflet that Messrs. Johnson, Clapham & Morris have given due prominence as being licensees under Brown's patents.—Yours faithfully,

Arthur Hey,
For W. H. Brown.

36-38 Victoria Street, Westminster:
February 3, 1910.

## THE FOUNTAIN COURT, HAMPTON COURT PALACE.

The view shows the north-west corner of the quadrangle of William III., designed by Wren and executed about 1689-1700. It is so named on account of the fountain, which was formerly erected by Queen Elizabeth in the Clock Court of Wolsey's Palace and subsequently removed to this court. The court is not a perfect rectangle, the north and south sides being 116 feet 10 inches, the east side 110 feet 1 inch, and the west 109 feet. The height of the cloisters is 12 feet and they are composed of open arcades of semicircular arches supported on rectangular piers of stone with roofs formed with brick groining supporting the floors of the state rooms over. The carved stonework was carried out by William Emmitt, under the supervision of Grinling Gibbons, who was directly responsible for the heads on the keystones. The carving to the circular windows on the second floor represents lion skins draped over garlands of bay leaves and supported at the top corners by anchors. The stonework is partly Portland and partly an Oxfordshire oolite, and the brickwork is composed of thin red rubbed bricks.

It is interesting to note that Wren's private office during the building was situated just behind the cloisters of the communicating gallery, shown on the left hand of the drawing.

This court was measured by Mr. Reginald Pywell in the early part of 1908. The figure in the foreground is a copy from the original by Mr. E. J. Sullivan.

The proposal to erect a new band stand in the Municipal Gardens, Lord Street, Southport, at a cost of 450*l.*, has just been approved.

Mr. Thomas Adams, of 3 Pall Mall East, London, has been appointed Town Planning Comptroller to the Local Government Board. Mr. Adams, who is a Scotsman, became the first secretary of the Garden City Association about ten years ago, and later became secretary and manager of First Garden City, Ltd.

Cheltenham Town Council have refused to accept a motion to enforce trade union rates of wages upon all contractors who do work for the Corporation.

Mr. Edward Shewbrooks, of the firm of Messrs. Shewbrooks & Hodges, architects, Newcastle-on-Tyne, died very suddenly on the 5th inst.

The Notts Football Club have finally decided to commence the preparation of a new ground in Meadow Lane, at a cost of 4,000*l.* The scheme includes the erection of a large new pavilion, and the re-erection of a stand now standing at their old ground. The plans have been prepared by Messrs. W. & R. & F. Booker, architects, Nottingham.

Mr. T. J. Bailey, who retired from the post of education architect to the London County Council on January 1, is to be retained at a fee of 300*l.* a year for two years in a consultative capacity. He will be available for consultation with his successor only, and not with any committee or member of the Council.

A local syndicate has acquired the remainder of the Lewis estate, of about forty acres, extending from Cliftonville Cliffs to West Northdown, for building purposes.

## CUBICAL EXTENT AND UNITING OF BUILDINGS.

ON October 15, 1907, the London County Council decided to seek the amendment of sections 75, 76 and 77 of the London Building Act, 1894, so as to enable the Council to allow horizontal separation of buildings and increased cubical extent in buildings of the warehouse class, and to give the Council discretionary power with regard to openings in party walls, the construction and materials of fire-resisting doors, and the uniting of buildings. The Building Act Committee at the time suggested that it would be desirable that a statement should be drawn up and adopted by the Council laying down the principles which would guide the Council when dealing with applications for permission to erect buildings exceeding 250,000 cubic feet in extent, &c.; but an amendment that this object should be secured by the inclusion of regulations in the amending Act was lost. The required amendments of the Act having been obtained by Part III. of the London County Council (General Powers) Act, 1908, the Building Act Committee have drafted, in consultation with the Fire Brigade Committee, the regulations, which are given below. They have arranged with the Fire Brigade Committee that all applications made under Part III. of the Act of 1908 shall be dealt with by themselves alone as far as possible in accordance with these regulations, if approved by the Council, but that in the event of their decision with regard to any application being contrary to the views of the chief officer of the London Fire Brigade, an opportunity shall be afforded to the Fire Brigade Committee of considering the matter before any recommendation with regard to such application is submitted to the Council.

### REGULATIONS WITH REGARD TO APPLICATIONS UNDER PART III. OF THE LONDON COUNTY COUNCIL (GENERAL POWERS) ACT, 1908.

*Additional cubical extent.*

1. No application for consent to the provision of additional cubical extent shall be entertained in respect of a building which is or is to be in more than one occupation.

2. All consents shall be subject to such fire-extinguishing appliances being provided as may in the opinion of the Council be necessary, and to direct telephonic communication being established with a London Fire Brigade station if required by the Council.

3. Particulars of the methods of heating, lighting and ventilation proposed to be adopted shall be submitted.

4. Arrangements for lessening the danger from fire in premises in respect of which consent is given shall be properly maintained. Premises will be liable to inspection by the chief officer of the London Fire Brigade to ensure such proper maintenance.

5. In dealing with applications in respect of buildings of the various classes set out hereunder, the following principles shall be considered in conjunction therewith. In any case they may be varied or other conditions imposed, as the Council think fit. These regulations are to be considered in conjunction with the provisions of the Act, and in no way as a modification of those provisions.

(A) As regards buildings not more than one storey in height in one occupation and used exclusively for the manufacture of boilers or machinery in metal, and for all kinds of metal work in connection with metal-framed structures, such cubical extent may be allowed as may in the opinion of the Council be reasonable, having regard to the circumstances of the case, provided that—

(i.) The building be more than two miles distant from St. Paul's Cathedral if the operations of smelting or melting be carried on therein.

(ii.) The building, including fittings and fixtures, but excluding doors, windows, skylights, lantern lights and their frames, be constructed throughout of incombustible materials.

(iii.) Any portion of the building used for the manufacture or storage of oils or varnishes, moulds, models, frames, patterns or other substances or articles of a combustible nature, be properly and efficiently separated from, and not included in, the portion of the building in respect of which additional cubical extent may be allowed and do not exceed the limits prescribed in the Act.

(B) As regards buildings of more than one storey in height in one occupation and used exclusively for the use, manufacture or storage of non-inflammable or fire-resisting or incombustible materials, such cubical extent may be allowed as may in the opinion of the Council be reasonable, having regard to the circumstances of the case, provided that—

(i.) The height of the building do not exceed 60 feet, measured from the pavement level to the upper surface of the floor of the topmost storey.

(ii.) The building be not less than 40 feet from any other building, except where it is entirely separated therefrom by an imperforate wall of the thickness required by the London Building Act, 1894, and of the full height of the higher building throughout.

(iii.) The building be constructed throughout of incombustible material, and the doors, windows, skylights, lantern lights and their frames be constructed of fire-resisting materials.

(iv.) All floors be imperforate except as hereinafter provided, and be furnished with scruppers to carry off water poured on during a fire.

(v.) All constructional ironwork below the level of the surface of the floor of the topmost storey be protected by not less than two inches of incombustible material.

(vi.) All openings in the external walls or roofs, excepting staircase windows and shop windows on the ground floor when the show spaces are separated from the main building by fire-resisting enclosures, be fitted with fire-resisting frames filled in with fire-resisting doors, shutters or glazing, a sufficient portion of the filling of the openings above the ground storey being made so as to be easily opened from the outside in order to facilitate the ingress of firemen.

(vii.) Vertical shafts for staircases, staircase enclosures, lifts, hoists, shafts or trunks for pipes or wires, and other leads and horizontal ducts, be properly and efficiently separated by walls and fire-resisting doors from the divisions in respect of which additional cubical extent is required, and from any other division communicating therewith, and be so arranged that the access to such shafts or ducts from any floor shall be provided with a secondary incombustible enclosure with self-closing fire-resisting doors.

(viii.) If any vertical shafts be roofed, the roofs be constructed of light frames, filled in with thin glass and protected on the outside by strong wire guards, and the shafts be carried up not less than three feet above any adjoining roofs. In the case of a shaft not carried up to and through the roof, it be sealed over at the top with solid incombustible material not less than six inches thick.

(ix.) All horizontal trunks, ducts, &c., be enclosed with solid incombustible material not less than three inches thick.

(x.) Any portion of the building used for packing or for the storage of packages be properly and efficiently separated from the portion of the building in respect of which additional cubic extent may be allowed.

(xi.) When the building is more than two storeys above the ground storey, and the total extent between party walls exceeds one million cubic feet, there be provided at least one unenclosed staircase constructed of brick and concrete, affording access to all floors and the roof through the outer air, without any internal communication with the building.

(xii.) If the building exceeds 250,000 cubic feet, $\frac{1}{8}$th at least of the total length of the boundaries of the site do abut upon a thoroughfare or thoroughfares not less than 40 feet wide. If the building exceed 1,000,000 cubic feet, $\frac{1}{4}$th at least of the total length of the boundaries of the site do abut upon a thoroughfare or thoroughfares not less than 40 feet wide. If the building exceed 2,000,000 cubic feet, $\frac{1}{2}$ at least of the total length of the boundaries of the site do abut upon a thoroughfare or thoroughfares not less than 40 feet wide. If the building exceed 3,000,000 cubic feet, $\frac{3}{4}$ths at least of the total length of the boundaries of the site do abut upon a thoroughfare or thoroughfares not less than 40 feet wide. If the building exceed 4,000,000 cubic feet, the site be an island site.

(C) As regards buildings of more than one storey in height in one occupation and used for the sale and storage or manufacture, but not for storage purposes only, of goods of a non-fire-resisting nature, or used for the purposes of a trade involving the use of materials of a non-fire-resisting nature, additional cubical extent may be allowed, subject to the provisos (i.) to (xii.) set out in paragraph (B), and provided also that—

(xiii.) The basements be entirely cut off from the ground floor and upper floors of the building and approached only by a separate means of access from the outside of the building.

(xiv.) Any lifts from the basements be adjacent to an external wall or do have no internal communication with the storeys above.

(xv.) No division or cell on any floor formed by the vertical and horizontal separations do exceed 250,000 cubic feet, and the floor area of such division or cell do not exceed 20,000 square feet.

(xvi.) Every floor be of the thickness required by the Council, such thickness not being less than 6 inches.

(d) As regards buildings of not more than three storeys in height in one occupation and used as motor garages or car-sheds, or for other similar purposes, such cubical extent may be allowed as may in the opinion of the Council be reasonable, having regard to the circumstances of the case, provided that—

(i.) The building be constructed throughout of incombustible materials, and be completely separated by imperforate walls from adjoining properties.

(ii.) Any store for petrol be completely separated from the main building.

(iii.) Any portion of the main building used for the manufacture or storage of varnishes or oils, or moulds, models, frames, patterns or other substances or articles of a combustible nature be properly and efficiently separated from and not included in the portion for which additional cubical extent may be allowed and do not exceed the limits prescribed in the Act.

*Openings in party walls.*

6. Applications for consent to openings larger than those allowed by the Act in party walls separating divisions of cubical extent will not be entertained unless the buildings affected be constructed throughout of incombustible materials, and unless—

(i.) The openings be fitted with double doors or shutters in accordance with the provisions of the Act at a distance apart of not less than one-fourth of the full width of the proposed opening.

(ii.) The width of all such openings taken together on each floor do not exceed one-half of the length of the party wall on each floor in which they occur.

*Uniting of buildings.*

7. Applications for consent to the uniting of buildings of the warehouse class with buildings of the same class or with any other buildings, either or both being in different occupations, will not be entertained when the combined cubical extent of the buildings to be united exceeds 250,000 cubic feet.

## VARIETIES.

A new Wesleyan chapel is to be built at Newport Road, Barnstaple, seating 250 and costing 1,269*l*.

A site has been cleared in the western end of the borough of Chelsea for the erection of new premises for the Stanley Ward Conservative Club.

The Royal Commission on the Preservation of Ancient and Historical Monuments have decided to schedule the Whitgift Hospital, Croydon, as among the monuments in Surrey most worthy of preservation.

The West Bromwich Town Council have decided that application be made to the Local Government Board for sanction to a loan of 17,900*l*. for the erection of new schools at Hill Top, to accommodate 1,280 scholars, together with workshop, dining, cookery, and laundry centres.

Dunoon parish church is to be reconstructed. When the alterations are carried out there will be accommodation for 922. The present seating accommodation is 700. The cost is estimated at 4,000*l*.

St. Mary's Church, Barton-on-Humber, is to undergo extensive restoration at the expense of an anonymous donor. The work will include the filling of the east window with new glass, the restoration of the south aisle, the substitution of a tiled floor in the sanctuary, and the provision of altar rails and a new oak altar.

Plans have been prepared by Mr. Hillersden Bulteel for the rebuilding of the Devon and Cornwall Ear and Throat Hospital, Plymouth. The work is to be carried out in sections, and will be commenced as soon as the first 1,000*l*. is collected.

The executive committee of the Scottish Exhibition of National History, Art, and Industry, Glasgow, 1911, invite competitive designs suitable for poster, and for illustrating other official publications in connection with the exhibition. The prizes offered are 40*l*., 20*l*. and 10*l*. The designs must be sent in by March 15.

A new road is to be made on Exmoor from Brendon to Couplehan Two Gates, a distance of about thirteen miles, which will traverse some of the finest scenery in West Somerset. The contract, amounting to 3,577*l*., has been let to Messrs. Pethick Brothers, Plymouth.

During the stripping of the walls of a room at the Barnhurst Old Hall, belonging to the Wolverhampton Corporation, the workmen discovered a fine old wainscot panelling of exquisite carving of the Jacobean period. It extends from the floor to the ceiling of the room, which is 18 feet square and 15 feet high and is in perfect condition.

Negotiations for the purchase of the ruins of Sampson's Factory, Castle Boulevard, Nottingham, which was destroyed by fire eight years ago, were completed last week by Mr. J. Holdsworth, flock manufacturer, of Beeston, who proposes to rebuild the factory on the existing walls and foundations, which are very massive, and to let the premises as a tenement lace factory. The necessary plans have been prepared and the contract will be let as soon as possible.

The general works committee of Coventry City Council, to whom the question was remitted some months ago, has decided to invite architects to send in alternative plans showing how the vacant land in Earl Street can be best utilised for the erection of municipal buildings, and for a scheme for such buildings and town hall, the latter absorbing adjoining property, including St. Michael's Baptist Chapel, Messrs. Browett's solicitors' offices, &c.

Worksop Priory Church is to be enlarged by the rebuilding of the choir and the restoration of the Early English Lady chapel, which is at present in a ruined condition. The Augustinian Priory at Worksop, of which the present parish church and ruined Lady chapel are the remains, was founded by Sir William de Lovetot about the year 1103. The minster was completed about 1170, and was one of the most important religious houses, next to Roche, in the district. The architect for the present scheme is Mr. Harold Brakspear.

Mr. H. T. Hare, F.R.I.B.A., submitted at the meeting last week of the Bangor University College Council designs for the Pritchard-Jones Great Hall, estimated to cost 17,000*l*., which, subject to the approval of the donor, were accepted. The hall will accommodate about 1,000 persons, and includes a large entrance hall, or crush room, with ample cloakroom accommodation. Four external statues are to be provided by another donor.

The oak screen in Salisbury Cathedral separating the north-east transept from the north choir aisle, probably erected in the eighteenth century, consisting of fourteenth and fifteenth century work, and made up of much inferior material, which was taken away some months ago, has now been re-erected. The inferior material has been removed, as well as the paint with which it had been covered. The work has been done by Messrs. Noyes & Green, of Crane Street, under Mr. C. E. Ponting, the cathedral architect.

A member of the Bangor City Council aroused much interest some time ago by his statement that an examination of a large number of the old oil-paintings till recently stored in the old Museum were found to bear such names as Rubens, Titian, Vandyke, and others equally well known. It was thought that some, if not all, might be valuable old masters, or at any rate copies of the same, and the Council engaged an expert to examine and value the pictures. The expert now reports, "None of them are original works, nor have any of them any value."

The Marquis of Tullibardine, M.P., Grand Master Mason of Scotland, presided at the quarterly meeting of the Grand Lodge, held in the Freemasons' Hall, George Street, Edinburgh, on the 3rd inst. Plans were submitted by the Past Grand Architect (Mr. A. Hunter Crawford, F.R.I.B.A.) of the proposed reconstruction of the Grand Lodge premises in George Street, at an estimated cost of about 30,000*l*. It was agreed to proceed at once with the scheme. The existing hall, which was erected over fifty years ago, and the front buildings are to be cleared away and the new offices will be erected on the site.

Mr. H. A. Reed, the Local Government Board inspector, held an inquiry last week into the application of the Liverpool Corporation for sanction to borrow 225,500*l*. for improvement schemes under Part I. of the Housing of the Working Classes Act, 1890, for the improvement of the Beau Street, Bevington Street, Holly Street, Frank Street, Grafton Street, and Saltney Street unhealthy areas, including the erection of dwellings for the working class on land within those areas. The Liverpool Corporation have spent about a million pounds sterling on the demolition of insanitary property and the erection of new houses, and it involves a 2*d*. rate. The present sum of 225,500*l*. is divided into 104,000*l*. for the purchase of the areas, and 121,000*l*. for new buildings to house 2,960 persons. Most of the land has been already acquired. It is proposed to provide each house with a bath, and each dwelling will be on a self-contained system. A recreation ground of half an acre is proposed in the area between Bevington Street and Bond Street, with a separate playground for boys and girls, and a bandstand is to be provided.

THE

# Architect and Contract Reporter.

FRIDAY, FEBRUARY 18, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

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*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

BLYTH.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

LEEDS.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l*., 50*l*., and 25*l*. for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l*. 2*s*. Secretary, John W. Fawcett, 10 Albion Street, Leeds.

MARCH 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Apply before Feb. 10 to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

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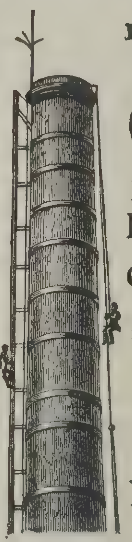

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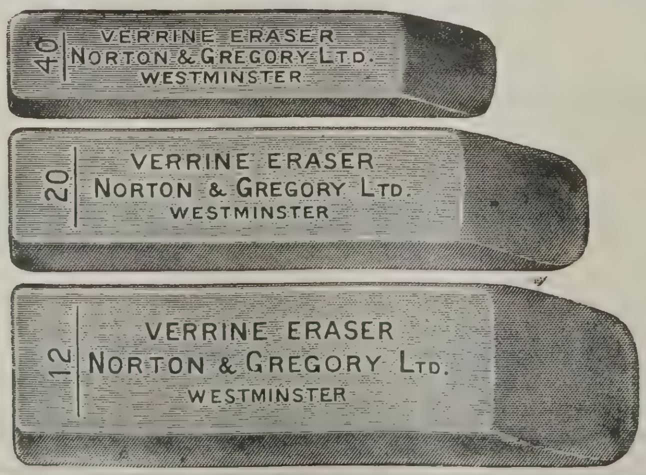

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## CONTRACTS OPEN.

Belfast.—Feb. 22.—For carrying out the following works, for the Guardians:—(1) Dining hall, work-room and dormitories; and (2) dormitories for infirm inmates. Charge 10s. Messrs. W. H. Stephens & Sons, surveyors, 13 Donegall Square North.

Bellingham.—March 5.—For erecting new out offices, constructing a drainage system, &c., at the Bellingham Council school, Northumberland. Deposit 1l. 1s. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

Chester.—March 1.—For alterations and additions to public elementary school in Victoria Road. Deposit 1l. Mr. Phillip H. Lockwood, architect, St. Werburgh Street, Chester.

Chipping Barnet.—March 3.—For erection and completion of a new manual instruction and cookery centre at Byng Road. Deposit 2l. 2s. The County Surveyor's Office, Hatfield.

Cockerham.—Feb. 23.—For rebuilding Cockerham Church. Messrs. Austin & Paley, architects, Lancaster.

Darlington.—March 8.—For erecting offices at Stooperdale for the North Eastern Railway Locomotive Department. Mr. William Bell, architect to the North Eastern Railway, York.

Dawdon (Durham).—Feb. 23.—For the erection of a church at Dawdon, Seaham Harbour (first portion). Mr. C. Hodgson Fowler, F.S.A., architect, The College, Durham.

Distington.—Feb. 21.—For the various works required in erection of shop, warehouse, and dwelling-house at Distington, Cumberland. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

Edinburgh.—Feb. 22.—For raising existing car sheds, roofs, &c., at Henderson Row cable power station. Deposit 2l. 2s. Mr. J. Walker Smith, burgh engineer, City Chambers, Edinburgh.

Grasmere.—Feb. 26.—For the whole or separate works required in the erection of a pair of semi-detached villas at Grasmere, Westmoreland. Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

Handsworth.—Feb. 22.—For the erection of a new station at Handsworth, Birmingham, for the Great Western Railway. The New Works Engineer, Paddington Station, London.

Hazel Grove.—Feb. 22.—For the demolition of certain buildings in Chapel Street, Hazel Grove, near Stockport. The Surveyor, Council Offices, Hazel Grove.

Ireland.—Feb. 24.—For building certain labourers' cottages in the Mohill Rural District. Charges 5s. Mr. E. Greelan, clerk, Council Offices, Mohill.

Ireland.—Feb. 28.—For station building at Creaghanroe, near Castleblayney; goods office at Keady, and goods shed at Smithborough, for the Great Northern Railway Co. (Ireland). Mr. F. A. Campion, chief engineer, Amiens Street Terminus, Dublin, or of the District Engineer, Belfast.

Ireland.—March 2.—For erecting a shop and offices at Lucan. The Lucan and District Co-operative Society, Ltd., 3 The Mall, Lucan.

Ireland.—March 5.—For proposed works of sanitation and alteration to New Ross union workhouse, comprising the undermentioned:—(1) Drainage and water supply; (2) erection and completion of sanitary annexes, &c.; (3) plumbing and hot water circulation; (4) erection of a new kitchen and annexe at the fever hospital. Mr. J. A. Ryan, architect, 33 Catherine Street, Waterford.

Landrake.—Feb. 22.—For the following works, viz.:—Alterations and additions to farm buildings at Lowertown. The County Land Agent, Public Rooms, Truro.

Leadgate (Durham).—Feb. 21.—For erection of new stores at Allendale Cottages. The Leadgate Industrial and Provident Society, Ltd., Leadgate, Durham.

Leeds.—Feb. 21.—For the demolition of three houses, building gable and boundary wall, levelling and asphalting an open space, and providing and fixing railings round same in Blackman Lane. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Lichfield.—May 7.—For the erection of 16B Married Soldiers' Quarters in one block, at the Whittington Heath Barracks. Deposit 10s. Apply by February 25 to the Director of Barrack Construction, 80 Pall Mall, London, S.W. (See advertisement.)

London.—Feb. 24.—For certain alterations in the kitchen at the workhouse in Bancroft Road, Mile End. Mr. Benjamin Catmur, clerk, Bancroft Road, Mile End.

London.—March 5.—For erection of a permanent school to accommodate 1,636 children, on the Down Lane site, for the Tottenham education committee. Deposit 2l. 2s. Send names by March 5 to Mr. G. E. T. Laurence, A.R.I.B.A., 22 Buckingham Street, Adelphi.

Macclesfield.—Feb. 26.—For the completion of the St. Peter's Church tower. Mr. Jabez Wright, 27 King Edward Street, Macclesfield.

Manchester.—Feb. 23.—For the construction of a public convenience at Long-sight Library. The City Architect, Town Hall, Manchester.

Middlesbrough.—Feb. 21.—For alterations to 59½ Linthorpe Road. Messrs. Moore & Archibald, architects, 27 Albert Road, Middlesbrough.

Mirfield.—Feb. 28.—For the various works required in the erection of four dwelling houses, Coppinhall Road, Mirfield, Yorks. Messrs. Ainley & Hirst, architects, surveyors and valuers, Slaithwaite, near Huddersfield.

Newburn (Northumberland).—Feb. 28.—For erection of Council offices. Deposit 2l. 2s. Mr. Edward Cratney, architect, 88 Station Road, Wallsend.

Normanton.—March 5.—For erection of girls' school at Normanton, Yorks. Send names by February 21 to Mr. Arthur Hartley, architect, County Chambers, Castleford.

Royton.—Feb. 21.—For the carrying out of the work comprised in the public urinals to be erected in Oldham Road and Bleasdale Street, Royton, near Oldham. Mr. Ernest Woodhouse, F.R.I.B.A., 88 Mosley Street, Manchester.

Saddleworth (Yorks).—March 4.—The West Riding education committee invite whole or separate tenders for the following work:—Saddleworth Uppermill new school (builder, joiner, slater, plasterer, plumber, painter, road maker. The Education Architect, County Hall, Wakefield. Send 1l. deposit to the West Riding Treasurer, County Hall, Wakefield.

St. Dennis.—Feb. 25.—For erection of a dwelling-house and shop at Fore Street, St. Dennis, Cornwall. Mr. B. C. Andrew, M.S.A., architect, Biddick's Court, St. Austell.

Sale.—March 5.—For new County high school for girls at Sale, Cheshire. Deposit 2l. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Salford.—March 3.—For structural alterations at the Union Infirmary, Hope, Pendleton. Deposit 2l. Mr. H. Lord, F.R.I.B.A., 42 Deansgate, Manchester.

Salisbury.—March 2.—For structural alterations at the Municipal Offices, Endless Street. Mr. W. J. Goodwin, A.M.I.C.E., city engineer and surveyor, Municipal Offices, Salisbury.

Scotland.—Feb. 22.—For the erection of a new post office at Kelso. Deposit 1l. 1s. H.M. Office of Works, Parliament Square, Edinburgh.

Scotland.—Feb. 22.—For mason, joiner, plumber, slater, plasterer, painter, and heating engineer work of additions to Webster's seminary, Kirriemuir. Mr. Lake Falconer, architect, Blairgowrie.

Scotland.—Feb. 25.—The district committee of the Middle Ward of the County of Lanark are prepared to receive tenders for the erection of buildings to contain refuse destructor; also for steel chimney stack, the provision of water supply and drainage, and the formation of access road and other relative works at Boggs Brae, near Bellshill. Deposit 1l. Mr. W. L. Douglass, C.E., district engineer, District Offices, Hamilton.

Seaforth.—Feb. 21.—For erection of the Rawson Road school, Seaforth, near Liverpool, for the Waterloo with Seaforth Urban District Council. Bills of quantities may be obtained from Mr. John I. Thompson, clerk, Town Hall, Waterloo, near Liverpool, upon payment of a deposit of 1l. 1s. Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Sheffield.—Feb. 22.—For extensions and alterations of the Training College for Teachers, Collegiate Crescent. The City Architect, Town Hall, Sheffield.

Shrewsbury.—March 12.—For erection of secondary schools to accommodate 350 pupils at The Priory. Deposit 3l. 3s. Send names by February 22 to Mr. Frank H. Shayler, F.R.I.B.A., and Mr. James A. Swan, joint architects, 16 Pride Hill, Shrewsbury.

Skipsea.—Feb. 26.—For erection of a Wesleyan chapel, Skipsea, Yorks. Mr. Samuel Dyer, architect, 29 Quay Road, Bridlington.

Stockport.—Feb. 28.—For the labour and materials required in erection of a shelter tool house and conveniences in the Recreation Ground, Reddish. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

Stockton-on-Tees.—Feb. 21.—For the heightening, by 20 feet, of the workhouse laundry chimney. Mr. J. Rodham, Finkle Street, Stockton.

Sutton-in-Ashfield.—Feb. 23.—For the construction of a masonry gasholder tank, 105 feet diameter and 26 feet 6 inches deep, for the Sutton-in-Ashfield Urban District Council. Deposit 3*l.* 3*s.* Send names and addresses to Messrs. Corbet Woodall & Son, Palace Chambers, Bridge Street, Westminster.

Syresham.—Feb. 22.—For the erection of a class room and other minor alterations at Syresham school, Northants. Send names to Messrs. Law & Harris, architects, 1 Sheep Street, Northampton.

Thorne.—Feb. 23.—For alterations and additions to the workhouse infirmary. Mr. Harold Forster, architect, North Field, Thorne, Yorks.

Unsworth.—Feb. 28.—For twenty houses proposed to be erected in Parr Lane. The Whitefield and Unsworth Cooperative Society, Ltd., 273 Bury New Road, Whitefield, near Manchester.

Wales.—Feb. 23.—For the construction of a swimming bath at the South Wales and Monmouthshire Truant School, Merthyr Tydfil. Mr. C. M. Davies, architect, High Street, Merthyr.

Wales.—Feb. 23.—The Glamorgan County Territorial Force Association invite tenders (*a*) for proposed gun sheds and stores in Dumfries Place, Cardiff, and (*b*) for extensive repairs at the Drill Hall Buildings. Deposit 1*l.* 1*s.* each. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wales.—Feb. 26.—For erection of two dwelling houses at Tondu. Mr. Jesse Hurley, architect, 10 Bridgend Road, Aberkenfig.

Wales.—Feb. 28.—For erection of twenty-two houses in three blocks, and six pairs of semi-detached villas, together with the construction of roads, sewers, and surface-water drains, on the Meyrick Estate, Gwaelodygarth Field, Merthyr Tydfil, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—March 1.—For the erection of a temporary pavilion, for the Royal National Eisteddfod of Wales, Colwyn Bay. Send names and addresses to Messrs. Darbyshire & Smith, architects, 17 Brazennose Street, Manchester.

Walberswick.—Feb. 25.—For erection of a Primitive Methodist Church at Walberswick, Suffolk. Mr. A. F. Scott, architect, 24 Castle Meadow, Norwich.

Waterloo-with-Seaforth.—March 21.—For the erection of a secondary and technical school in Cambridge Road, Seaforth. Deposit 3*l.* Mr. H. Littler, county architect, 16 Ribblesdale Place, Preston.

Wellington.—Feb. 25.—For erection of public baths, for the Wellington (Salop) Urban District Council. Contract No. 1, for erecting the baths; (2) heating and warming. Deposit 2*l.* 2*s.* Mr. J. W. Littlewood, clerk, Bank Chambers, Wellington, Salop.

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Mr. G. H. Willoughby, F.R.I.B.A., of Manchester and St. Annes, has been appointed by the Oldham Town Council to act as adjudicator on the competitive designs submitted by local architects for the town hall extension, at an estimated cost of 25,000*l.*

The death occurred on the 6th inst., at Forest Hill, of Mr. William Robert Green, M.I.M.E., who was for about half a century associated with R. Waygood & Co., Ltd., the lift and crane manufacturers. Born at Poole in 1838, Mr. Green joined his uncle, the late Richard Waygood, who had founded the present business, in 1833, at Beaminster, Dorset, and who had removed it in 1840 to works in Newington Causeway. The work then consisted principally in the making of agricultural machinery, and in hot-water engineering; but, in the early sixties, the manufacture of small hand-lifts was commenced. Under Mr. Green, who became a partner, the construction of sugar, rice, oil and other machinery was added. The lift making part of the business rapidly increased, and among the first hydraulic lifts was a book lift made and fitted, soon after 1865, at the Court House at Ryde, Isle of Wight. When the business was formed into a private limited company, Mr. Green was a director, and since his recent retirement he acted as consulting engineer to the company, which now employs nearly a thousand hands as compared with the eighteen to twenty when Mr. Green joined in about 1860.

# TENDERS.

## CARSHALTON.

For the construction of four quiescent settlement tanks and roof over existing tanks, four percolating filters, &c., at the sewage farm, for the Urban District Council.

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| Prockter & Kenyon | 2,607 | 7 | 0 |
| Belliss & Morcom | 2,500 | 0 | 0 |
| Richardson, Westgarth & Co. | 2,463 | 12 | 0 |
| Hall & Sons | 2,450 | 0 | 0 |
| Browett, Lindley & Co. | 2,365 | 0 | 0 |
| Worthington Pump Co. | 2,348 | 0 | 0 |
| Mirrlees, Watson & Co. | 2,340 | 0 | 0 |
| Westinghouse Electric and Manufacturing Co. | 2,280 | 0 | 0 |
| Midland Engineering Co. | 2,198 | 0 | 0 |
| Allen & Son | 2,140 | 0 | 0 |
| Storey & Sons | 2,137 | 12 | 0 |
| Brush Electrical Engineering Co. | 2,014 | 0 | 0 |
| Willans & Robinson (*accepted*) | 1,888 | 0 | 0 |
| Thompson | 1,779 | 10 | 0 |

## EXMOUTH.

For alterations and additions to the Exeter Road Council schools. Mr. P. Morris, architect (education), Exeter. Quantities by Mr. S. W. Haughton, Plymouth.

| | | | |
|---|---|---|---|
| Wakeham Bros. | £1,994 | 0 | 0 |
| Setter & Son | 1,892 | 0 | 0 |
| Pethick Bros. | 1,836 | 0 | 0 |
| Pratt | 1,703 | 12 | 7 |
| Stanbury | 1,640 | 12 | 0 |
| Cooper & Son | 1,639 | 11 | 0 |
| Perry, Exmouth (*accepted*) | 1,615 | 12 | 0 |

## HERNE BAY.

For paving, &c. (1) the Broadway, (2) South Cliff Drive, for the Urban District Council. Mr. F. W. J. Palmer, C.E., surveyor.

| | | | |
|---|---|---|---|
| Head | £3,995 | 0 | 0 |
| Furley | 3,978 | 0 | 0 |
| Ingleton Bros. | 3,797 | 0 | 0 |
| Hardy & Co., Woking (*accepted*) | 3,170 | 0 | 0 |

## LONDON.

For the erection of a coroner's court at Poplar, for the L.C.C.

| | | | |
|---|---|---|---|
| Abbot & Charlton | £4,023 | 19 | 11 |
| Pasterfield & English | 3,695 | 0 | 0 |
| Reason | 3,597 | 0 | 0 |
| Webb | 3,589 | 0 | 0 |
| Cripps & Son | 3,485 | 0 | 0 |
| Newell & Lusty | 3,463 | 0 | 0 |
| F. & G. Foster | 3,333 | 0 | 0 |
| Barker & Co. | 3,329 | 0 | 0 |
| King & Son | 3,318 | 0 | 0 |
| Webster & Son | 3,299 | 0 | 0 |
| Woollaston & Co. | 3,295 | 0 | 0 |
| Sabey & Son | 3,283 | 0 | 0 |
| Lawrence & Sons | 3,254 | 0 | 0 |
| Lowe & Co. | 3,250 | 0 | 0 |
| Sumpter & Co. | 3,235 | 0 | 0 |
| Nightingale | 3,209 | 0 | 0 |
| Parsons | 3,047 | 0 | 0 |
| Gathercole Bros., Norbury (*accepted*) | 3,000 | 0 | 0 |

### LONDON—*continued.*

For the erection of a building to accommodate the trade school for girls at the L.C.C. Hammersmith School of Arts and Crafts.

| | | | |
|---|---|---|---|
| Rowley Bros. | £2,321 | 9 | 0 |
| Holloway | 1,487 | 0 | 0 |
| Wall | 1,472 | 12 | 0 |
| Carmichael | 1,352 | 0 | 0 |
| Roberts & Co. | 1,312 | 10 | 0 |
| J. & C. Bowyer | 1,271 | 0 | 0 |
| Johnson & Co. | 1,270 | 0 | 0 |
| Holloway Bros. | 1,237 | 0 | 0 |
| Spencer, Santo & Co. | 1,233 | 0 | 0 |
| F. & H. F. Higgs | 1,199 | 0 | 0 |
| **Munday & Sons**, Trinity Square (*accepted*) | 1,084 | 0 | 0 |

For alterations and additions to No. 22 Saville Place, Lambeth Walk. Mr. Eugene C. Beaumont, architect, 78 Fleet Street.

| | | | |
|---|---|---|---|
| Bargman, Son & Co. | £508 | 10 | 0 |
| Smith & Son | 492 | 0 | 0 |
| Barrett & Power | 460 | 0 | 0 |
| Bragg & Sons | 454 | 0 | 0 |

For providing and fixing two boilers and a low-pressure hot-water heating apparatus in a school in course of construction in Torriano Avenue, St. Pancras.

| | | | |
|---|---|---|---|
| Turner & Co. | £785 | 0 | 0 |
| Wontner-Smith, Gray & Co. | 679 | 0 | 0 |
| Comyn Ching & Co. | 679 | 0 | 0 |
| Phillips & Son | 672 | 0 | 0 |
| Stevens & Sons | 652 | 0 | 0 |
| Purcell & Nobbs | 645 | 0 | 0 |
| Macintosh & Sons | 644 | 8 | 0 |
| J. & F. May | 620 | 0 | 0 |
| Ashwell & Nesbit | 557 | 0 | 0 |
| Palowkar & Sons, Queen Street (*recommended*) | 542 | 0 | 0 |
| Architect's estimate | 575 | 0 | 0 |

For installing electric lighting and bells in the new Poplar divisional offices in Tredegar Road.

| | | | |
|---|---|---|---|
| British Westinghouse Electric and Manufacturing Co. | £198 | 13 | 8 |
| Stegmann & Co. | 152 | 14 | 6 |
| Tilley Bros. | 148 | 10 | 0 |
| Weston & Sons | 143 | 0 | 0 |
| Johnson & Phillips | 136 | 0 | 0 |
| Sweet Bros. | 134 | 0 | 0 |
| **Newbald & Co.**, Sutton (*accepted*) | 133 | 0 | 0 |

For the paving and sewer works in connection with the widening and extension of Baltic Street and the widening of Hatfield Street, Baltic Street area, St. Luke.

| | | | |
|---|---|---|---|
| Wood & Sons | £2,335 | 2 | 10 |
| Manders | 2,162 | 8 | 3 |
| Brebner & Co. | 1,950 | 18 | 10 |
| Patterson | 1,897 | 11 | 11 |
| Mowlem & Co., Westminster (*recommended*) | 1,833 | 0 | 0 |
| Chief engineer's estimate | 1,873 | 0 | 0 |

### LONG BUCKBY.

For building new grocers' and drapers' shops, with an assembly hall above, for the Co-operative Society.

| | | | |
|---|---|---|---|
| Berry | £2,002 | 0 | 0 |
| Luck | 1,935 | 0 | 0 |
| Webster | 1,886 | 0 | 0 |
| Green | 1,843 | 0 | 0 |
| W. & H. Foulds | 1,762 | 0 | 0 |
| Hawtin | 1,750 | 0 | 0 |
| Howe & Son | 1,725 | 0 | 0 |
| Chown | 1,699 | 0 | 0 |
| **Brown & Son**, Wellingborough (*accepted*) | 1,694 | 0 | 0 |

### MARLOW.

For cemetery works, for the Urban District Council. Mr. C. S. Vardy, architect, Maidenhead.

| | | | |
|---|---|---|---|
| Childs & Townsend | £1,012 | 12 | 6 |
| Hunt & Son | 707 | 0 | 0 |
| Newbery | 692 | 0 | 0 |
| Plumridge | 669 | 9 | 6 |
| Cox & Son | 666 | 0 | 0 |
| Silver & Sons | 648 | 0 | 0 |
| Taylor | 628 | 0 | 9 |
| Lovell & Son | 618 | 0 | 0 |
| Jefferson | 610 | 0 | 0 |
| Keates & Gill | 555 | 0 | 0 |
| **Harris & Marlow** (*accepted*) | 525 | 0 | 0 |

### LONGTOWN.

For erection of a dwelling house and outbuildings, near Longtown, for the Cumberland County Council.

| | | | |
|---|---|---|---|
| Liddell | £391 | 0 | 0 |
| Musgrave | 335 | 0 | 0 |
| Batey & Sons | 298 | 0 | 0 |
| Storey | 289 | 10 | 0 |
| **Laing & Son**, Carlisle (*accepted*) | 286 | 5 | 7 |

### MORLEY (YORKS).

For the various works required in extension of mill premises, Perseverance Mills. Mr. T. A. Buttery, F.I.A.S., architect, Queen Street, Morley.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Spensley, joiner | £439 | 0 | 0 |
| Spensley, mason | 406 | 11 | 0 |
| Newsome, Askham & Co., ironfounder | 66 | 10 | 0 |
| Rogerson, slater | 50 | 0 | 0 |
| Stakes, plumber | 21 | 5 | 0 |

### OAKHAM.

For erection of new offices for the Rutland Education Committee. Mr. H. F. Traylen, A.R.I.B.A., architect, Stamford.

| | | | |
|---|---|---|---|
| Willmott & Sons | £774 | 0 | 0 |
| Roberts Bros. | 725 | 0 | 0 |
| Rudd & Son | 700 | 0 | 0 |
| Halliday | 693 | 0 | 0 |
| Bell & Sons | 689 | 0 | 0 |
| Hinson & Co. | 664 | 0 | 0 |
| Edlington | 663 | 0 | 0 |
| Woolston | 650 | 0 | 0 |
| Bowman & Sons | 649 | 0 | 0 |
| Hockley & Co. | 641 | 13 | 10 |
| Peasgood | 634 | 0 | 0 |
| Howes | 624 | 0 | 0 |
| Brown | 597 | 0 | 0 |
| Nichols Bros. | 595 | 4 | 0 |
| Higgs & Sons | 587 | 11 | 9 |
| Hickman | 549 | 9 | 0 |
| **Hibbitt**, Oakham (*accepted*) | 538 | 16 | 6 |
| Architect's estimate | 580 | 0 | 0 |

### OKEHAMPTON.

For erecting a new higher elementary school for 120 children, with laboratory, &c., for Devon County Education Committee. Mr. Percy Morris, county architect (education), Exeter.

| | | | |
|---|---|---|---|
| Ball & Son | £4,443 | 11 | 11 |
| Pethick Bros. | 4,442 | 0 | 0 |
| Bennett | 4,205 | 0 | 0 |
| Stanbury | 4,134 | 5 | 8 |
| Bryer, jun. | 4,070 | 12 | 6 |
| Crockerell | 4,047 | 0 | 11 |
| Harris & Co. | 3,950 | 0 | 11 |
| Paynter | 3,942 | 5 | 0 |
| Sleeman & Son | 3,840 | 13 | 3 |
| **Blatchford & Dawe**, Okehampton (*accepted*) | 3,797 | 16 | 6 |

### OSWESTRY.

For alterations to conveniences, shelters, &c., at Cae Glas Park. Mr. G. William Lacey, C.E., borough engineer and surveyor.

| | | | |
|---|---|---|---|
| Higgins | £318 | 17 | 3 |
| Jones & Evans | 297 | 19 | 5 |
| Felton | 277 | 10 | 0 |
| **Thomas**, Oswestry (*accepted*) | 268 | 12 | 0 |
| Borough engineer's estimate | 268 | 0 | 0 |

For additions and alterations to house, Cae Glas. Mr. G. William Lacey, C.E., borough engineer and surveyor.

| | | | |
|---|---|---|---|
| Higgins | £216 | 10 | 8 |
| Jones & Evans | 213 | 4 | 8 |
| Thomas | 198 | 0 | 0 |
| **Felton**, Oswestry (*accepted*) | 179 | 10 | 0 |
| Borough engineer's estimate | 200 | 0 | 0 |

For excavating, levelling, and forming bowling green and tennis court at Cae Glas Park. Mr. G. William Lacey, C.E., borough surveyor.

| | | | |
|---|---|---|---|
| Jones & Cooper | £229 | 10 | 0 |
| Jones & Evans | 216 | 4 | 1 |
| Mackery | 209 | 12 | 0 |
| Thomas | 193 | 0 | 0 |
| **Greenley**, Leominster (*accepted*) | 164 | 19 | 7 |
| Borough engineer's estimate | 205 | 0 | 0 |

## RICHMOND

For constructing new sewers and roads on the Red Lion Street area, for the Town Council. Mr. J. H. Brierley, borough surveyor, Town Hall, Richmond, Surrey.

| | | | |
|---|---|---|---|
| Pedrette | £2,421 | 4 | 1 |
| Acme Flooring and Paving Co. | 2,300 | 5 | 10 |
| Hamiltons | 2,298 | 14 | 9 |
| Watson | 2,190 | 0 | 0 |
| Adams | 2,165 | 13 | 3 |
| Wimpey & Co. | 1,995 | 0 | 0 |
| Jarman & Co. | 1,979 | 0 | 0 |
| Kavanagh & Co. | 1,926 | 11 | 6 |
| Mowlem & Co., Westminster (*accepted*) | 1,567 | 0 | 0 |
| Borough surveyor's estimate | 2,085 | 0 | 0 |

## SPURSTOW.

For alterations and additions to school buildings, for Cheshire County Council Education Department. Mr. H. Beswick, county architect, Chester.

| | | | |
|---|---|---|---|
| Morrey | £842 | 10 | 0 |
| Astles | 518 | 0 | 0 |
| Brookes | 510 | 0 | 0 |
| Cox & Vaughan | 480 | 0 | 0 |
| Wright & Sons | 480 | 0 | 0 |
| Reece Bros. | 473 | 0 | 0 |
| Gresty & Sons | 470 | 0 | 0 |
| Matthews | 460 | 0 | 0 |
| Parker, Beeston (*accepted*) | 420 | 0 | 0 |

## TERRINGTON ST. CLEMENT.

For alterations and additions to a house at Terrington St. Clement. Messrs. Walker & Walker, architects, Terrington, and King's Lynn.

| | | | |
|---|---|---|---|
| Dickerson Bros. | £451 | 17 | 6 |
| Johnson & Son | 432 | 15 | 0 |
| West | 395 | 0 | 0 |
| Yash & Langley | 380 | 0 | 0 |
| Barnes | 375 | 0 | 0 |
| Hampton | 375 | 0 | 0 |
| Bone | 363 | 0 | 0 |
| Hornigold | 361 | 8 | 0 |
| Clarke | 348 | 10 | 0 |
| Eggleton | 337 | 0 | 0 |
| Rilett, Terrington St. Clement (*accepted*). | 336 | 11 | 6 |
| Green | 332 | 13 | 0 |
| Holman | 309 | 0 | 0 |

## WALES.

For constructing new cattle market, sheds, concrete beds, boundary walls, &c., exclusive of ironwork, for the Narberth Cattle Market Co., Narberth. Mr. J. Preece James, architect.

| | | | |
|---|---|---|---|
| Griffiths | £1,050 | 0 | 0 |
| Thomas Bros. | 975 | 0 | 0 |
| Parry | 950 | 0 | 0 |
| Rees & Sons, Llan Mills (*accepted*) | 800 | 0 | 0 |

For the erection of a dwelling house and out-offices at Pentlepoir, near Tenby, for Mr. Geo. Lewis. Mr. J. Preece James, architect.

| | | | |
|---|---|---|---|
| Poole (*accepted*) | £475 | 0 | 0 |

For pulling down old premises and erecting two shops and dwelling houses on the site in High Street, Tenby, for Mrs. McCulloch. Mr. J. Preece James, architect.

*First contract.*

| | | | |
|---|---|---|---|
| Phillips | £1,585 | 0 | 0 |
| Adams & Parcell | 1,087 | 14 | 0 |
| Thomas & Son, Tenby (*accepted*) | 1,077 | 0 | 0 |

## WATFORD.

For erecting a new warehouse, granary, &c., in Queen's Road. Mr. C. P. Ayres, architect, Watford.

| | | | |
|---|---|---|---|
| King & Sons | £943 | 17 | 9 |
| Eames | 935 | 0 | 0 |
| Clifford & Gough | 935 | 0 | 0 |
| W. & D. Wilkins | 825 | 0 | 0 |
| Bracey & Clark | 920 | 0 | 0 |
| Brown | 917 | 0 | 0 |
| Brightman & Son | 911 | 0 | 0 |
| Wiggs & Sons | 900 | 0 | 0 |
| Tyler | 898 | 10 | 0 |
| Ensor & Ward, Watford (*accepted*) | 893 | 0 | 0 |
| Clark Bros. | 887 | 10 | 0 |

## WEYBRIDGE.

For the erection of a house in Oatlands Chase, Oatlands Park. Messrs. Crickmay & Sons, architects and surveyors, 13 Victoria Street, Westminster, S.W., and Weymouth.

| | | | |
|---|---|---|---|
| Jarvis | £2,029 | 18 | 0 |
| Nicholson | 1,952 | 0 | 0 |
| Trask & Sons | 1,885 | 0 | 0 |
| Hill & Son | 1,865 | 0 | 0 |
| Drowley & Co. | 1,807 | 0 | 0 |
| Annett | 1,745 | 0 | 0 |
| Ranger | 1,621 | 17 | 6 |
| Gaze & Sons, Walton-on-Thames (*accepted*) | 1,501 | 0 | 0 |

## TRADE NOTES.

The directors of John Oakey & Sons, Ltd., recommend the payment of a final dividend at 5 per cent. to the Ordinary shareholders, making a total of 10 per cent. for the year, and in addition a bonus of 5 per cent. free of income tax, leaving a balance of 6,202*l*. 15*s*. 3*d*. to be carried forward to next year.

Messrs. George Mills & Co., Ltd., engineers, Radcliffe (the proprietors of the "Titan" sprinkler), are frequently receiving letters from home and abroad showing the value of sprinklers in mills and works. One of the most recent is of a fire having broken out in the mixing room of the Textile Manufacturing Co., Bombay, India, which was quickly extinguished by the "Titan" sprinklers, which were installed some time ago.

Messrs. E. H. Shorland & Brother, of Failsworth, Manchester, have recently supplied their patent Manchester stoves, with descending smoke flues and ventilators to the Workhouse infirmary extensions, Sheffield. Amongst other recent contracts by the firm are the following:—The additions to the Commercial Travellers' Schools, Pinner, are being warmed and ventilated by means of Manchester stoves and Manchester grates; the Runcorn Conservative Club is being ventilated by Shorland's patent exhaust roof ventilators and special inlet panels; the extensions to the Isolation Hospital, Lowestoft, are being warmed and ventilated by means of Manchester stoves with descending smoke flues; the Infectious Diseases Hospital, Darwen, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves and patent exhaust roof ventilators.

The National Provident Institution will hold their seventy-fourth annual meeting at the Cannon Street Hotel, London, on the 25th inst. The report shows that in the past year 1,576 proposals for assurance were accepted by the Board amounting to 692,959*l*., and the new premiums annually payable on which amount to 29,697*l*. The amount of new business exceeds that transacted in any previous year of the Institution's existence. The accounts for the year show a balance of receipts over disbursements of 162,634*l*., which increases the accumulated funds of the Institution by that amount to 6,688,106*l*.

The Metal Jointing Co., Ltd., Adelphi House, W.C., are the makers of "Amalgaline"—a patent that is expected to revolutionise the ordinary clumsy methods of lead jointing. Amalgaline is a metallic ribbon 0.05 millimetre thick, treated with a composition to prevent the formation of oxides. On the application of heat the ribbon melts at a lower temperature than the metals to be acted upon, and causes their amalgamation at a considerably lower temperature than their normal melting point. The process is briefly as follows:—For jointing lead pipes a patent cutter is used to cut the ends of the pipe to a dead true fit in the form of a spigot and socket or coned joint. On placing a strip of amalgaline between the cleaned surfaces to be joined and applying heat sufficient to melt the strip, the surfaces of the lead fuse, and in fusing they amalgamate. Amalgaline is in no sense a solder. The invisible joints thus obtained are very strong and neat, and are expeditiously and simply made, no matter how inconveniently the pipe may be situated. The Metropolitan Water Board, after a severe test, have accepted this method of jointing. Amalgaline is applicable to the making of metal joints for very many purposes besides the ordinary ones in lead pipes.

The *Diario Official* of Brazil, says the *Board of Trade Journal*, publishes a decree authorising the opening of a special credit amounting to 24,000*l*. in favour of the Ministry of Justice and Home Affairs, for the completion of the building intended for the National Library.

## VARIETIES.

Mr. William Longden was elected President of the Sheffield Master Builders' Association at the annual meeting on the 10th inst., in place of Mr. W. W. Mears, retired.

Croydon borough council have declined to adopt a proposal to pay the trade union rate of wages to all their employés, and insert a clause in all contracts under their control compelling the contractor to do the same.

Messrs. W. Mortimer & Son, architects, Lincoln, have prepared sketch plans of a proposed receiving home at the Workhouse. The plans, which have been adopted, are estimated to cost 2,000*l.*

The Yardley Rural Council on Tuesday resolved that competitive plans for the erection of an isolation hospital to accommodate eighty beds be invited from architects within a radius of fifty miles, and that premiums of 50, 25, and 15 guineas respectively be offered for the best three sets.

The Belfast Corporation are about to undertake an extension of their gas works at a probable cost of nearly 150,000*l.*, inclusive of plant. The consulting engineers recommend the use of the Twin Island site, which is situated in Belfast Lough, on the city boundary, and is owned by the Harbour authorities.

The Great Western Railway Company contemplate the expenditure of a further 20,000*l.* for improvements at Newton Abbot passenger station. The scheme includes the construction of a new goods depôt near the Kingsteingnton Road, with which considerable progress has been made, so far as the filling is concerned, and for the carrying out of which a vote of 25,000*l.* was made in 1908.

Mr. Justice Parker last week gave judgment in an action in which the proprietors of a young ladies' school in Eaton Road, Hove, claimed a perpetual injunction to restrain the Hove-Brighton Skating Rink Company, Ltd., from carrying on a skating rink in such a manner as to cause a nuisance to the plaintiffs. His Lordship held that an actionable nuisance had been established, and granted an injunction, which was suspended for a fortnight to enable the defendants to see whether the nuisance could be stopped by structural alterations.

Kodak, Ltd., have offered the London County Council a rent of 1,700*l.* a year for a lease for ninety-nine years of a site in Kingsway between Wild Court and Keeley Street. The site has an area of about 11,635 square feet with frontages of 77 feet, 174 feet and 145 feet to Kingsway, Wild Court and Keeley Street respectively, and adjoins the L.C.C. Wild Street, Holborn, school, the use of which for educational purposes may be discontinued. The offer is subject to the company having an option to take a lease, at a rent at the rate of 2*s.* a square foot a year of a portion of the site of the school in the event of this site becoming available for commercial purposes. The Improvements Committee recommend its acceptance.

Arrangements have been made for the delivery at the London County Council School of Building, Ferndale Road, Brixton, S.W., of two important lectures dealing with cement and concrete. The first, on "The manufacture and uses of Portland cement," will be given by Mr. A. C. Davis, F.C.S., A.I.C.E., &c., manager of the Saxon Portland Cement Company, on Friday, February 25, and the second, dealing with "Reinforced concrete," will be delivered by Mr. E. P. Wells, C.E., J.P., &c., on the following Friday, March 4. The lectures, to which admission is free, will each commence at 7.30 o'clock prompt; Mr. J. S. Holliday, chairman of the advisory sub-committee of the school, will preside on the first occasion, and Mr. H. D. Searles-Wood, F.R.I.B.A., a member of the committee, will take the chair at the second lecture.

The Hamilton Burgh School Board, N.B., have decided to proceed with the erection of new Academy buildings in accordance with the modified plans. The cost is estimated at 33,000*l.* exclusive of the site.

A small estate of some 9½ acres of land on the East Riding side of Selby has, it is understood, been purchased for the erection of a starch manufactory for a German firm. The site is close to the river Ouse.

The Old Kilpatrick School Board have accepted the plans for a new higher-grade school submitted by Messrs. Stewart & Paterson, architects, 14 Blythswood Square, Glasgow, at a cost of 14,077*l.* This sum does not include the price of special furniture to be provided for the laboratories and other details.

The opening of the new nurses' home at Leicester Infirmary took place on the 15th inst. The building has been erected at a cost of 22,500*l.*, this being the completion of the improvement and extension scheme, costing about 100,000*l.*, inaugurated by Sir Edward Wood. The contractors for the building were Messrs. Henry Herbert & Sons, Leicester, and the work was carried out under the superintendence of the architects, Messrs. Everard, Son & Pick, Leicester.

The Bournemouth borough surveyor, Mr. F. W. Lacey, F.R.I.B.A., is preparing plans and provisional estimates for the continuation of the under-cliff drive to Boscombe. The scheme includes provision for terraces in the cliffs, with shelters, and for another bathing station, and a slipway near the Boscombe Pier. The plans are, in addition, to provide for the extension of the drive round the flag-staff at Boscombe in a curve through the pleasure gardens, to join the over-cliff drive. The existing over-cliff drive is also to be improved.

The firm of electrical engineers who have taken a five-acre site at Abbey Park, St. James's, Northampton, with the option of three acres more, will, it is expected, employ about 400 men. It is anticipated that building operations will be begun shortly. There is a growing demand for houses in the district. Mr. G. H. Stevenson, the architect, is preparing plans for the development of the whole Abbey Park estate and adapting it for building purposes.

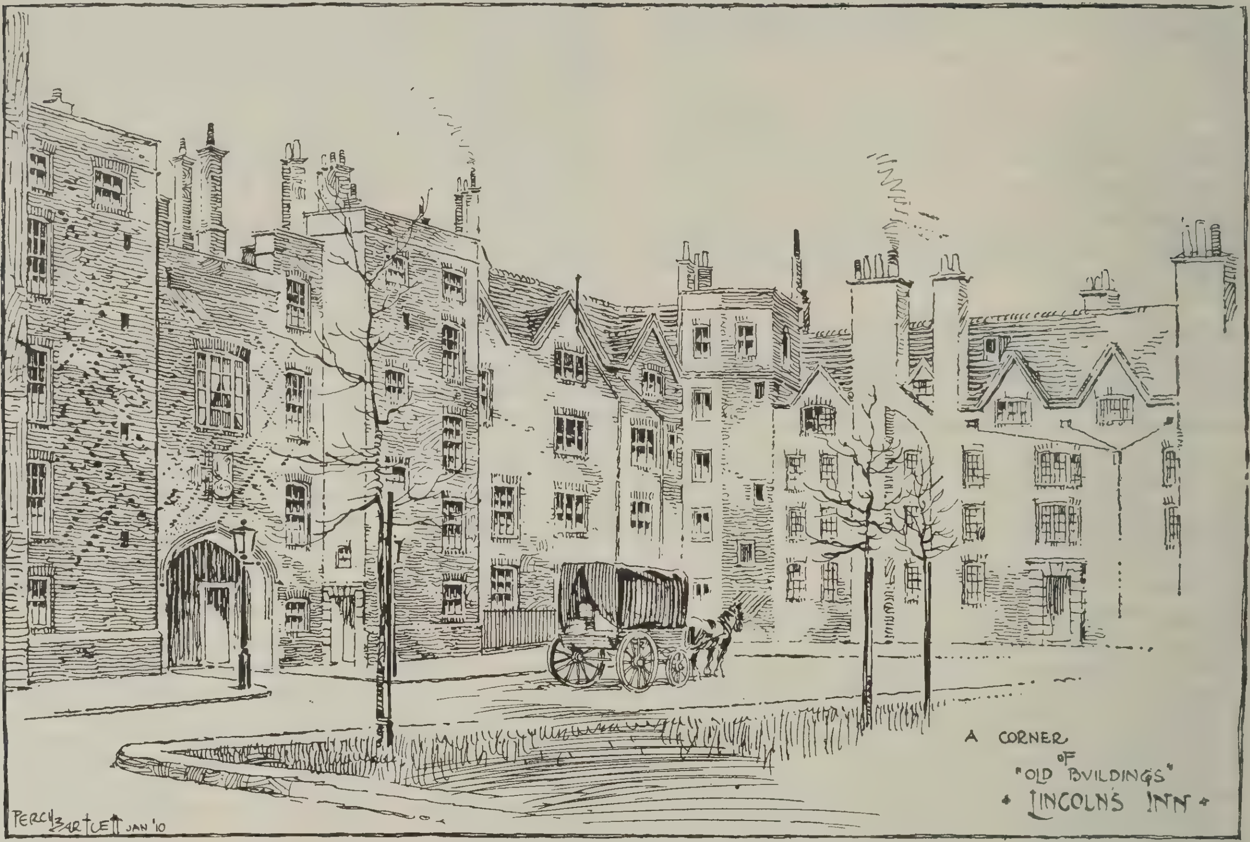
Mr. J. Simmons, C.E., Doncaster, has prepared a report for the Greasborough Urban Council on the sewerage of Mangham. This is in connection with the suggested making of new roads for opening out the school field at Parkgate for building purposes. The scheme will entail an expenditure of about 1,500*l.*, and this the Council unanimously agreed to undertake if an assurance was given by Earl Fitzwilliam's agent that a sufficient number of building plots would shortly be let.

The subscribers to the Perth Royal Infirmary on Monday approved the recommendation of the directors to erect a new infirmary at Tullylumb according to plans prepared by Mr. James Miller, A.R.S.A., architect, Glasgow. A site of over eleven acres has been feued from the Glover Incorporation at 15*l.* per acre. The sketch plans show a new infirmary consisting of four main ward blocks, each two storeys in height, with administrative department in the centre, dispensary, isolation block, &c. There is provision for 100 patients, and the estimated cost is 36,190*l.*, to meet which there is a fund of 31,783*l.* available. The meeting confirmed the appointment of Mr. Miller as architect of the new infirmary, approved generally of the plans, and authorised the directors to proceed with the erection of the building.

The contracts for the plant required in connection with the extension of the electricity station of the Brighton Town Council have been divided between Messrs. Richardsons, Westgarth & Co., Ltd., of Hartlepool; the British Westinghouse Company, Trafford Park, Manchester; and the General Electric Company, Ltd., of Birmingham. The main contracts will be executed by Richardsons, Westgarth & Co., Ltd., who are to provide a double-cylinder Parsons-Brown-Boveri turbine, coupled to a Siemens alternator, capable of giving a continuous output of 3,500 k.w., with a steam consumption of 14 lb. per k.w. hour at a normal load of 3,000 k.w.

The Town Clerk of Edinburgh has issued to the Lord Provost's Committee a report with regard to the development of the Fountainbridge district. He refers to the different attempts made to improve the district, and points out how circumstances are changed by the removal of the slaughter houses and the passing of the Housing and Town Planning Act. The slaughter house area must be dealt with at once, and it must be considered in relation to the neighbouring lands, which include the canal area. The report discusses the subject of the development of the slaughter house site with or without the development of the canal area. Reference is made to the advantage which the removal of the canal would be from a health point of view. Plans have been prepared by the Burgh Engineer showing tentatively the lines of a town planning scheme for the development of the district. The leading features are (*a*) the provision of a through road 60 feet in width connecting the Grange and Merchiston districts with the West End, Belford Bridge, and Queensferry Road; and (*b*) provision for intercepting from Earl Grey Street and Lothian Road traffic from the Merchiston and south-western districts bound for the Caledonian Railway, Princes Street, and eastwards.

## "THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



In these days of a somewhat strained picturesqueness it is a relief and a lesson to turn to work which relies upon its proportion and simplicity for dignity and charm. Such is represented in the accompanying sketch, made upon the spot, of "Old Buildings," formerly known as "Gatehouse Court." The gateway from Chancery Lane, with its flanking towers, is a fine specimen of Tudor red brickwork, in which, though darkened by age, is to be seen a diaper of black bricks. It is one of the few, if not the only, example of its kind in London. Over the arch, which has a hood or drip mould, on both fronts are to be seen stone panels bearing the Royal coat of arms, those of the Earl of Lincoln (from which this Inn of Court takes name), and others. The windows have been modernised. The gateway itself was erected in Henry VII.'s reign, the adjoining buildings being of later date. Cromwell was probably a frequent visitor, as Thurloe, his secretary, had chambers here.

## THE BRIXTON L.C.C. SCHOOL OF BUILDING.

As a result of a visit to the L.C.C. School of Building at Ferndale Road, Brixton, by the Federation of London Building Industries, the following letter has been addressed to the chairman of the Education Committee of the London County Council:—

"The following account of the visit will, I trust, convey to you and the Educational Committee of the L.C.C., some of the impressions made upon us as the result of inspecting the many interesting sides that the school presents, in the development of technical education as applied to the building industries.

"The Federation have consistently opposed what might be termed 'indiscriminate education.' By that we mean the education of a number of persons in trades or professions who have no intention of following same. Happily, at the Brixton School of Building 'indiscriminate education' does not exist, and we were assured by Mr. A. R. Sage, who conducted the party, that without exception all the evening students are working at the trades in which they are receiving instruction. In the case of the day students the fathers of the boys are required to sign a declaration that their sons are to follow the craft taught. The Federation regards the above with every satisfaction, as it not only insures the proper expenditure of public funds, but also safeguards the interests of the several trades concerned.

"The whole work of the school bears the stamp of intelligent treatment, the kindred trades working hand in hand in the carrying out of schemes which cannot fail to be instructive. For example, in the bricklayer's shop the students are building a wall in English bond, with part end wall, door and windows openings, &c.

"The carpenter students have made the necessary door frames, &c., and have also fixed same, thus securing for the students a practical demonstration of every-day building practice. This system appears to be carried a good deal further, for we were shown a very fine example of brickwork which had been executed from plans prepared by student draughtsmen under the instruction of Professor B. Pite, F.R.I.B.A.

"The plumbing class is a particularly good one, and we were shown some very good examples of work. Carpentry, painting, masonry are fully catered for, and some of the work in the masonry and carving shops is excellent. A beginning has been made with instruction in ferro-concrete construction, but all agree that this important study must be carried further, as little is known about it in this country; but we must all admit that in the practice of building construction in the future, ferro-concrete must play a very important part owing to its almost unlimited possibilities.

"Mr. G. Dew, L.C.C., the chairman of the Federation, is very keen on the special training of students in this important branch of the building trade, and there is much to be urged in favour of this course, as to-day the men who are engaged upon works where ferro-concrete is being employed have had little experience in the process, while the German workman has an intimate knowledge of it.

"In conclusion, let me state that the Brixton School of Building is not by any means a playhouse; on the contrary, we found it a home of science and intelligent training for building trade workers, and we heartily wish its work to be extended."

The Riccall Rural District Council has adopted plans for the erection of fifty houses on the Barlby Road, near Selby, close to where two new factories are to be started.

The Renfrew Parish Council have agreed to erect offices on the north side of the Clyde, near to Yarrow's Yard, at a cost of 2,000*l*.

will be utilised in producing the desired diffusion of the fresh air is, I think, greatly diminished. The great problem of uniform distribution of fresh air, therefore, seems to me to be, in a general way, easier of solution in a two-fan system than in a one-fan system.

2. *Double Glazing.*—I have little doubt but that a substantial part of the success is due to the double glazing of the windows. It is well known that still air, while allowing heat and light to radiate freely through it, is almost a perfect non-conductor of heat. Between the two sheets of glass in the windows is a layer of still air, which practically prevents heat from being conducted out of the hall through the window panes. If there had been one sheet of glass only, a substantial amount of heat would pass through the glass, and the air in contact with the windows would be cooled and rendered thereby heavier. In this way a downward cold current of air would be produced, and would descend near the walls on the heads of the audience below, to their great discomfort. But worse than this, the cold current of air would be composed largely of vitiated air, which would thus be again supplied to the occupants of the room. There is, in addition, the great economy of heat which is effected by the double glazing. It would be perfectly easy to ascertain by experiment the actual saving in fuel produced by double glazing an area of 950 square feet of window glass, given an average outside temperature of 45°, and an average inside temperature of, say, 65° Fahrenheit.

3. *The Warming of the Walls, Ceiling, &c., of the Room by means of Radiators.*—Before the audience assembles care is taken to raise the temperature of the walls, furniture, &c., to about 60°. In this way the warmed air is not seriously cooled by contact with the walls and ceilings, and the consequent down-draught is not substantially perceptible.

4. *The Facility with which the Temperature of the Incoming Fresh Air can, within Certain Limits, be Raised or Lowered.*—This appears to be essential in the case of a hall in which the number of the audience is variable, as it seems that the temperature of the fresh air supplied should, to some extent, vary inversely as the number of the occupants of the hall.

The great advantage of a two-fan system was, I believe, first pointed out by our chairman, Dr. Shaw. In a course of lectures, delivered in Cambridge a few years ago, Dr. Shaw showed that the energy required to drive a definite quantity of air into a cubical chamber and out again was less when two fans are used (one compressing, and the other dilating the air) than when one fan only is used, whether compressing or dilating. This being so, we were satisfied that the cost of running two fans, even including the additional working friction, could not substantially exceed the cost of running one only for the same amount of air moved. Moreover, we were aware that both plenum and vacuum systems have serious disadvantages connected with doors and windows, disadvantages which seem to disappear when two fans are used. Again, a remark in Dr. Shaw's recent work on air currents, to the effect that the loss of heat through windows seems to have no compensating advantage, encouraged us to recommend the University to go to the additional expense of double glazing.

I do not suppose that any system of ventilation, however complicated, can ever be perfect; that is, I do not expect that we can ever arrange that each occupant of a room shall breathe fresh air and fresh air only of exactly the temperature which he prefers. It might be done, I suppose, by laying on cold and warm fresh air by two separate pipes to each occupant. But this is not a practicable suggestion. We must in fact be satisfied at present with a general success, and this I hope we have attained to a very high degree in our large Examination Hall.

Dr. **Louis C. Parkes**, in opening the discussion, said that there were one or two points arising out of the paper which he should like to raise. The first was in connection with the use of double glazing in the windows. In a building like that described by Mr. Lock, and which was required for examinations, lectures, and dinners, it would no doubt serve a very useful purpose. But for ordinary uses it was very necessary that people should be able to see out of the windows; and this would be impossible if the inner sheet of glass is ground. Moreover, even if it were not ground, the view would necessarily be obscured. It would, perhaps, be possible to have a system whereby warm air is introduced between the double glazing for the purpose of preventing evaporation. Some years ago the Royal Courts of Justice had a very bad reputation for their ventilation. But more recently the Office of Works introduced practically the same system as that described by Mr. Lock. It has been found to answer extremely well as long as it is given a fair chance. The attendants are constantly watching the thermometers placed throughout the building, and as soon as a rise of temperature above 65° is observed instructions are telephoned to the engineer in the basement to increase the supply of fresh air. The problem in some of the courts was exceptionally difficult. For instance, it was quite impossible to foresee the extraordinary fluctuations in the number of people present. In a case of special general interest one court becomes packed while another would be almost empty. Unfortunately, too, some of His Majesty's Judges are not enamoured with the system of ventilation installed, and they insist on opening all the windows, with the result that the system is a total failure. Other Judges do not believe in ventilation of any sort, and so they stop the inlets and render the court very close and stuffy. The system of ozonisation had been tried in one court as a consequence of the Judge being obsessed with a fear of infectious disease. The Judge believed that any such danger would be removed by the introduction of ozone. But it was found that ozonising the air had no influence whatever on the destruction of germs, owing to the fact that the amount of ozone that could be introduced without producing unpleasant effects on the throat was so very small as to be almost negligible. Another large building that was ventilated on something like the lines described in Mr. Lock's paper was the House of Commons. Here the air was drawn in from the Terrace and introduced into the chamber through gratings in the floor. But that way had proved unsatisfactory, as the air became fouled by the dirt deposited on the floor by the members' boots before it reached the members' lungs. This may account for the fact that the House of Commons very early shows the ravages of influenza.

Mr. H. D. **Searles-Wood**, F.R.I.B.A., said he would like to put two questions to Mr. Lock. The first was whether any means were provided for cleaning the tubes which supply the fresh air to the Examination Hall; for in most cases they get into a very foul state if left to look after themselves. The second was, whether there was any way of moistening and cleansing the air as it passes through the battery chamber?

Mr. A. E. **Wheeler** thought that the paper was exceptionally interesting as being an account of a successful use of the plenum system. It supported the contention that had been often advanced, that if the plenum system was given a fair chance it would prove a success. In the cases of the failures it was usually traceable to negligence on the part of the attendants.

Mr. **Skinner** (Principal of the Chelsea Polytechnic), remarked that as a Cambridge man he did not retain the pleasantest recollections of the old arrangements under which they used to sit for examinations in the Corn Exchange. In that place there was a very ample supply of air, but very little heat. He would like to learn the opinion of the present undergraduates as to the efficacy of the large Examination Hall. In reference to the subject of heating as a whole, he wanted to make a small protest against the indiscriminate employment of the word "radiators." The instrument described in the paper heat by convection, and not by radiation.

Mr. G. **Hubbard** said that he had had the advantage of going over the Examination Hall at Cambridge with Mr. Lock. He thought he would be safe in saying that the system introduced was Mr. Lock's own system. There seemed to be no doubt that each candidate sitting in the Examination Hall got his fair share of fresh air. The double glazing of the windows was one of Mr. Lock's ideas. The imprisoned air between the panes was an excellent non-conductor of heat.

Mr. E. **Thomas Swinson** expressed his disappointment that the subject of ventilation had not been treated on broader lines. The only system spoken of that evening was a mechanical one. His own opinion, based on experience of public buildings, was that the one and only system which will work is a combination of the plenum and the vacuum. A great objection to the plenum was that it was so easy to throw out of order. Dr. Parkes had mentioned that the air of the House of Commons was fouled before it reached the members; this accorded with his own experience of the many public buildings in London where the air was introduced through undesirable inlets and drawn from undesirable places. Practical engineers should try to obviate this real danger. The question of humidity was a very serious factor in ventilation schemes. Greater regard should also be paid to the heat thrown off by the human body. In many buildings there were great difficulties encountered owing to the wrongful planning and the inability of architects to pay a due regard to ventilation.

Mr. J. R. **Preston** said that Mr. Lock's paper would seem to support the view that upward ventilation was better than downward. Twelve months ago many engineers favoured downward because the introduction of air was easy. The position of the heating and ventilating engineer was quite different in this country to what it was in countries like America, Austria, or Germany, where 10 per cent. of the cost of the building is expended on its heating and ventilation. The regulation of temperature was a most important thing, and a great market was awaiting a simple and cheap heat regulator; it would both effect a saving in fuel and be a great comfort. The introduction of ozone plant was extensively practised in the United States. It was remarkable that no technical school in this country had made ventilation and heating a separate subject, although it was now such an important science. Research had still to be done on an extensive scale, and contractors lacked the means to conduct it for themselves.

Mr. Henry Adams said the subject was a very important one from the health and the commercial point of view. The working efficiency of people in badly ventilated workshops was decreased by from 10 to 15 per cent., so that it was really a very good investment for a manufacturer to spend money in the proper heating and ventilation of his workrooms.

Dr. W. N. Shaw, in concluding the discussion, said that a good deal of stress had been laid on the subject of humidity. In his opinion it only became of importance when the temperature was 70°, 80°, or 90°; when the temperature was in the region of 60° or 65° there was no satisfactory evidence to prove that it was a vital matter. It was a question that had been talked about for a considerable time, and in many establishments a tank of water was to be seen like an offering to the goddess Humidity. The great difficulty that beset a scheme like that just described by Mr. Lock was the lack of sustained interest in it. During the summer the information evaporated, and when with the next term a new man comes to take charge of it there was no one to show him what he does not understand, and so the system suffers. The large Examination Hall at Cambridge should afford splendid opportunities for practical experiments in physics.

The Rev. J. B. Lock briefly replied to the points raised. All the tubes and ducts could be got at for cleaning purposes. With regard to experiments by the students of physics, his experience was that physicists were so occupied with theory that they would not busy their minds with so coarse a thing as practice.

## THE SOCIETY OF ENGINEERS.

The first ordinary meeting of the new Society, formed by the amalgamation of the Society of Engineers and the Civil and Mechanical Engineers' Society, was held on Monday, February 7, at Caxton Hall, Westminster. At the commencement the meeting was presided over by Mr. E. J. Silcock, M.Inst.C.E., F.S.I., F.G.S., last President of the Society of Engineers, and Mr. W. Noble Twelvetrees, M.I.Mech.E., A.M.I.E.E., last President of the Civil and Mechanical Engineers' Society. The premiums awarded by the Council of the Society of Engineers for papers read during 1909 were presented by Mr. E. J. Silcock as follows:—The President's gold medal to Dr. David Sommerville, for his paper entitled "Some Observations on the Chemistry and Bacteriology of Sewage Purification"; the Nursey premium of books to Mr. E. R. Matthews for his paper on "The Corrosion of Steel Reinforcement in Concrete"; and a Society's premium of books to Mr. W. E. Haldwell for his paper on "The Sinlumkaba Ferro-concrete Bridge." Mr. W. Noble Twelvetrees presented the following premiums awarded by the Civil and Mechanical Engineers' Society for papers read during the last session:—A premium of books and instruments to Mr. R. O. Wynne-Roberts for his paper on "The Past, Present and Future of the Organisation of the Engineering Profession," and a premium of books and instruments to Mr. H. Laurence Butler for his paper on "Specifications for Engineering Works."

Mr. Diogo A. Symons, M.Inst.C.E., M.I.Mech.E., the first President of the new Society, having taken the chair, votes of thanks to the Presidents of the constituent Societies were proposed by the senior Past Presidents, and seconded by the senior Vice-Presidents of the Society of Engineers and of the Civil and Mechanical Engineers' Society.

These resolutions were carried by acclamation, and the President then delivered his inaugural address.

After rendering thanks for his election as first President of the new Society, Mr. Symons alluded to the internal affairs of the Society, pointing out that since the amalgamation there were over 700 members, and putting in a plea for large attendances at the meetings. Referring to the examination which was to be the qualification for Fellowship of the new society, he believed that its introduction would have the same beneficial effect as had been the case in the Institution of Civil Engineers.

Proceeding to more general subjects, he called attention to the value of workshop training to engineering students, whether they intended to take up the civil or the mechanical branch of the profession. He belonged to the civil branch, but had often looked back with gratitude to the time he had spent in the shops.

Touching some of the branches of engineering work with which he was associated, the President referred to the question of water supply in foreign cities.

Ferro-concrete, so largely used at the present, had in many instances proved economical and entirely satisfactory for constructional works. He, however, considered that a large factor of safety should be allowed and every care taken to ensure the use of the very best materials and workmanship.

The question of the disposal of sewage was one which called forth innumerable inventions and improvements, but there was still a tremendous field for the energies of the engineer and the chemist. Referring to engineering work abroad, in which British capital was invested, the fact should not be overlooked that works financed in England were invariably designed by British engineers and carried out by British contractors, so that a great deal of outgoing capital returned to its source. In connection with foreign investments, "Government guarantees" were not always so satisfactory as the phrase seemed to imply, and it was important, before investing money in such enterprises, to ascertain as fas as possible the earning capacity of the project under consideration.

With regard to the motor industry, Mr. Symons called attention to the great advance that had been made in this branch of engineering, and referred to the dust nuisance and the traffic problem in large cities. He also quoted statistics showing the enormous increase in recent years of mechanically propelled vehicles, and the corresponding decrease in horsed vehicles.

Alluding to the subject of aviation, it was gratifying to note that British manufacturers and aeroplanists were making good headway, and that several aviation meetings were to be held in England during the present year.

Speaking of the education of young engineers, he emphasised the importance of a thorough grounding in fundamental principles before any attempt at specialisation was attempted, and laid stress on the advantage of gaining engineering experience with a contractor on public works. The tendency of engineering students to accept salaried appointments after too brief a training was deprecated because such appointments usually involved loss of valuable instruction and experience.

In conclusion, a further reference was made to the details of the amalgamation which had just been effected. A vote of thanks was heartily accorded to the President for his address, and the proceedings then terminated.

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The Acting British Trade Commissioner for South Africa (Mr. E. J. Cattell) reports that the contract for the erection of a new railway station at Pretoria has been signed. The cost of the work is to be 91,284*l*. The names of the contractors and of the architect for the station may be obtained by British firms interested on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

The Bacup Corporation has decided to apply for power to borrow 10,000*l*. for the widening of Burnley Road, and the arching of the river in preparation for the building of a new post office. Another 3,000*l*. is to be borrowed for the electric lighting of the borough. Bacup with Rawtenstall is committed to the expenditure of 25,000*l*. on a new technical institute to be built at Waterfoot. An elementary school is being built at a cost of 6,000*l*.

The Glasgow Corporation have approved the following motion:—"That there be inserted in all schedules and specifications issued to foreign manufacturers or their agents for the supply of goods required by any of the departments of the Corporation a clause to the effect that foreign offerers or their agents will be bound to produce evidence to the effect that, as far as practicable, their works are carried on in conformity with the Standing Orders of the Corporation relative to standard rate of wages and other conditions of labour; and that it be remitted to the town clerk to prepare and submit to the Corporation for their approval the form of such a clause."

THE

# Architect and Contract Reporter.

FRIDAY, FEBRUARY 25, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No. 4725 Holborn.*

*Branch Offices at 43* Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at 102* Colmore Row.

⁂ *Entered in the United States of America as second-class matter.*

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AGENTS FOR CANADA:

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*Subscription $5.20.*

AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

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South Africa: *Central News Agency, Ltd.*

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*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2* p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Blyth.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

King's Norton.—Feb. 26.—The Education Committee invite designs for a new elementary school to be erected at Woodgate, in the parish of Northfield. Apply by Feb. 26 to Mr. J. F. Moore, secretary, Education Offices, King's Norton.

Leeds.—March 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Secretary, John W. Fawcett, 10 Albion Street, Leeds.

March 1.—A committee of glazed brick manufacturers invite designs for works to be executed in glazed brickwork, also essays as to the advantages to be derived from the use of this material. Premiums of 100 gns., 50 gns., and 25 gns. awarded to designs and essays jointly. Mr. Max Clarke, F.R.I.B.A., assessor. Apply to Mr. J. Johnston Green, 142 Liverpool Road South, Southport.

Scotland.—March 21.—The Renfrew Parish Council invite plans and estimates for offices to be erected at Blawarthill, Yorker Road, near Scotstoun West Station. Deposit 10*s.* No premium. The Clerk to the Council, 1 Manse Street, Renfrew.

Sheffield.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l.* Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s.* Will be returned to those who send plans to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

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Bakewell.—March 1.—For erection of a new classroom at the National school. Deposit 5*s*. Mr. E. M. Longsdon, F.S.I., architect, Bakewell.

Barnstaple.—For erection of a residence in South Street, Newport, Barnstaple. Send names to Messrs. W. C. Oliver & Son, A.R.I.B.A., architects and surveyors, Barnstaple.

Bellingham.—March 5.—For erecting new out offices, constructing a drainage system, &c., at the Bellingham Council school, Northumberland. Deposit 1*l*. 1*s*. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

Boston.—For new Wesleyan church, Boston. Apply to Messrs. Gordon & Gunton, architects, Finsbury House, Blomfield Street, London, E.C.

Bristol.—March 4.—For erection of a garage and workshops at 138 Victoria Street, for the Bristol Waggon and Carriage Works Co., Ltd. Mr. Henry Williams, architect, Alliance Chambers, Corn Street, Bristol.

Bury St. Edmunds.—Feb. 28.—For the erection of a new chemical laboratory and demonstration room at King Edward VI. Grammar School. Mr. Ainsworth Hunt, architect, 51 Abbeygate Street, Bury St. Edmunds.

Cambridge.—March 3.—For the following work at Sheep's Green, for the Corporation, viz.:—(1) Erection of additional dressing-boxes at the women's bathing-place, and (2) erection of a steel bridge over the river from Coe Fen to the bathing-place. The Borough Surveyor, Guildhall, Cambridge.

Chester.—March 1.—For alterations and additions to public elementary school in Victoria Road. Deposit 1*l*. Mr. Phillip H. Lockwood, architect, St. Werburgh Street, Chester.

Chipping Barnet.—March 3.—For erection and completion of a new manual instruction and cookery centre at Byng Road. Deposit 2*l*. 2*s*. The County Surveyor's Office, Hatfield.

Cholsey.—March 12.—For the enlargement of the Council school at Cholsey, Berks. Deposit 2*l*. 2*s*. Send names by February 28 to the Secretary to the Education Committee, Market Place, Reading.

Cleckheaton.—March 3.—For the various works required in erection of additions to Exchange Mills. Messrs. R. Castle & Son, architects, London City and Midland Bank Chambers, Cleckheaton, Yorks.

Darlington.—March 8.—For erecting offices at Stooperdale for the North Eastern Railway Locomotive Department. Mr. William Bell, architect to the North Eastern Railway, York.

Dewsbury.—March 4.—For the various works required in erecting a large six-storey fire-proof warehouse and offices at Spinkwell Mills. Messrs. Kirk, Sons & Ridgway, F.R.I.B.A., architects, surveyors and valuers, Market Place, Dewsbury.

Dewsbury.—March 3.—For the builder's work required in additions to the caretaker's house at Whitley Reservoir. The Waterworks Engineer, Borough Surveyor's Office, Town Hall, Dewsbury.

Dovercourt.—For the execution of the following works:—Erection of detached residence, garage, entrance gates, and fences, &c., Rookery Estate; erection of detached residence, main road; erection of detached residence, Fronks Road; erection of detached residence, St. Michael's Road. Mr. H. Steward Watling, F.S.A., architect, High Street, Dovercourt.

Edinburgh.—March 3.—For supply and erection of two portable buildings constructed of wood and iron, for the Edinburgh School Board. Mr. G. W. Alexander, clerk, Castle Terrace, Edinburgh.

Exeter.—March 7.—For additions and alterations at St. Luke's College, Heavitree Road. Mr. James Jerman, F.R.I.B.A., 1 Bedford Circus, Exeter.

Haverhill.—March 5.—For the erection of a brick tower and tank for water storage at Kedington Workhouse. Charge 2*s*. 6*d*. Mr. G. E. Mitchell, A.R.S.I., Ashen Road, Clare, Suffolk.

Halifax.—March 7.—For the mason, joiner, plumber, slater and plasterer, and electrician works required in the alteration of the old Riding School, Halifax, into an electric theatre. Messrs. Richard Horsfall & Son, architects and surveyors, 22a Commercial Street, Halifax.

Harwich.—March 3.—For certain repairs, restoring the east windows and other glazing, painting and cleaning, at St. Nicholas parish church. Mr. Groom, Harwich.

Hatton.—March 5.—For the extension of the Hatton Council school, Derbyshire. Deposit 1*l*. 1*s*. Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

Hayton.—March 1.—For alterations and extensions to the Hayton Public Room, Cumberland. Mr. S. P. Barbour, Hayton, Bullgill, S.O.

Hereford.—March 1.—For alterations to premises, No. 7 Commercial Street, at corner of Gomond Street. Mr. Ernest G. Davies, M.S.A., architect, 132 Widemarsh Street, Hereford.

Hetton-le-Hole.—March 9.—For erection of a Council chamber and offices. Mr. John Harding, surveyor, Township Offices, Hetton-le-Hole.

Huddersfield.—March 9.—For erection of an elementary school at Birkby. Deposit 2*l*. 2*s*. Mr. K. F. Campbell, M.I.C.E., M.I.E.E., borough engineer, 1 Peel Street, Huddersfield.

Hull.—March 14.—For the erection of a school in Southcoates Lane. Deposit 2*l*. 2*s*.. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Hurst.—March 11.—For erection of a new elementary school for 150 scholars, at Hurst, near Ashton-under-Lyne, Lancashire. Deposit 2*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Ireland.—March 2.—For erecting a shop and offices at Lucan. The Lucan and District Co-operative Society, Ltd., 3 The Mall, Lucan.

Ireland.—March 2.—For the construction of additional bathing boxes at the Royal Victoria Baths, Kingstown. The Town Surveyor, Town Hall, Kingstown.

Ireland.—March 5.—For proposed works of sanitation and alteration to New Ross union workhouse, comprising the undermentioned:—(1) Drainage and water supply; (2) erection and completion of sanitary annexes, &c.; (3) plumbing and hot water circulation; (4) erection of a new kitchen and annexe at the fever hospital. Mr. J. A. Ryan, architect, 33 Catherine Street, Waterford.

Keadby.—March 3.—For six dwelling-houses at Keadby, Doncaster. Mr. George Sinclair, architect, Church Lane, Crowle.

Leicester.—March 4.—For the construction of underground conveniences for both sexes in Infirmary Square, Oxford Street. Deposit 10*s*. Mr. E. George Mawbey, M.I.C.E., borough surveyor, Town Hall, Leicester.

London.—March 5.—For erection of a permanent school to accommodate 1,636 children, on the Down Lane site, for the Tottenham education committee. Deposit 2*l*. 2*s*. Send names by March 5 to Mr. G. E. T. Laurence, A.R.I.B.A., 22 Buckingham Street, Adelphi.

London.—March 8.—For plastering work in the "E and F" ward at the Sick Asylum, Devons Road, Bromley-by-Bow, London, E., for the Managers of the Poplar and Stepney Sick Asylum District. The Engineer and Superintendent of Labour at the Asylum.

Mexborough.—March 14.—For erection of six almshouses and other works incidental thereto at Church Street. Deposit 1*l*. Mr. G. Fenwick Carter, C.E., surveyor, Council Offices, Mexborough.

Newcastle-on-Tyne.—For the excavation and foundations for proposed Queen's Hall in Princess Street, Lisle Street. Messrs. Graham & Hill, architects, 6 Eldon Square, Newcastle-on-Tyne.

Pendleton.—March 3.—For structural alterations at the Union Infirmary, Hope. Deposit 2*l*. Mr. H. Lord, F.R.I.B.A., 42 Deansgate, Manchester.

Prestwich (Lancs.).—Feb. 28.—For the erection of new kitchens, stores and bakery, and other alterations to the administrative department at the asylum. Deposit 2*l*. 2*s*. Mr. Thomas Chadwick, A.R.I.B.A., architect, 16 Princess Street, Manchester.

Saddleworth (Yorks).—March 4.—The West Riding education committee invite whole or separate tenders for the following work:—Saddleworth Uppermill new school (builder, joiner, slater, plasterer, plumber, painter, road maker. The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

Sale.—March 5.—For new County high school for girls at Sale, Cheshire. Deposit 2*l*. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Salford.—March 3.—For structural alterations at the Union Infirmary, Hope, Pendleton. Deposit 2*l*. Mr. H. Lord, F.R.I.B.A., 42 Deansgate, Manchester.

Salisbury.—March 2.—For structural alterations at the Municipal Offices, Endless Street. Mr. W. J. Goodwin, A.M.I.C.E., city engineer and surveyor, Municipal Offices, Salisbury.

Scotland.—March 5.—For the removal of the existing lifeboat house and the construction of a new lifeboat house at Girvan, in the county of Ayr, N.B. Mr. James Smith, local hon. secretary, Town Clerk's Chambers, Girvan, or at the office of the engineer and architect to the Royal National Lifeboat Institution, Mr. W. T. Douglass, M.I.C.E., 15 Victoria Street, Westminster, S.W.

Scotland.—March 8.—For alterations to the Swinton parish church, Duns. Deposit 10*s*. Mr. T. P. Marwick, architect, 43 York Place, Edinburgh; or Mr. A. D. Walker, School House, Swinton, Duns.

Shepshed.—March 5.—For erection of a handicraft centre at Shepshed, Leics., together with out-offices, drainage and other works connected therewith. Deposit 5*l*. 5*s*. The Architect, County Education Office, 33 Bowling Green Street, Leicester.

Skipsea.—Feb. 26.—For the erection of a Wesleyan chapel. Mr Samuel Dyer, architect, 29 Quay Road, Bridlington.

Sowerby Bridge.—March 14.—For the mason and bricklayer, carpenter and joiner, slater and plasterer, plumber and glazier, cast-iron and steel, concretor and painter work required in erection of a five-storey cotton mill, Walton Street. Mr. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

St. Helens.—March 21.—For erection of a school in North Road. Deposit 1*l*. 1*s*. Mr. Frank S. Biram, architect, George Street, St. Helens, Lancs.

Stockport.—Feb. 28.—For the labour and materials required in erection of a shelter tool house and conveniences in the Recreation Ground, Reddish. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

Stratton St. Margaret.—March 1.—For an addition to the kitchen, improvements to infants' day room, and a new dormitory for the infants, at the workhouse, Stratton St. Margaret, Wilts. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

Unsworth.—Feb. 28.—For twenty houses proposed to be erected in Parr Lane. The Whitefield and Unsworth Cooperative Society, Ltd., 273 Bury New Road, Whitefield, near Manchester.

Wakefield.—March 4.—The West Riding education committee invite whole or separate tenders for the following works:—South Elmshall new infants' school, Skipton, Broughton Road new school (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, Wakefield.

Wales.—Feb. 27.—For building forty-two houses at Abercwmboi, near Aberdare, for the Abercwmboi Building Club. Mr. Alec S. Cameron, architect, 1 Glanant Street, Aberdare.

Wales.—Feb. 28.—For alterations and additions to Unitarian church and school, Monk Street, Aberdare. Mr. J. Llewellin Smith, M.S.A., architect, Aberdare.

Wales.—Feb. 28.—For erection of twenty-two houses in three blocks, and six pairs of semi-detached villas, together with the construction of roads, sewers, and surface-water drains, on the Meyrick Estate, Gwaelodygarth Field, Merthyr Tydfil, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—March 1.—For the erection of a temporary pavilion, for the Royal National Eisteddfod of Wales, Colwyn Bay. Send names and addresses to Messrs. Darbyshire & Smith, architects, 17 Brazennose Street, Manchester.

Wales.—March 1.—For the alterations and additions to Tyluce House, Llangorse, Breconshire. Mr. B. L. Pritchard, Castle Street, Brecon.

Wales.—March 2.—For the building of a shop and dwelling-house at Plymouth Street, Merthyr. Mr. C. M. Davies, 112 High Street, Merthyr.

Wales.—March 4.—For the erection of two houses at Little Mill, near Pontypool. Mr. D. C. Udell, architect and surveyor, Commercial Street, Pontypool.

Wales.—March 5.—For erection of a schoolroom at Caeracca Pant, Dowlais, for the Bethania Congregational Church. Mr. John Rees, secretary, Winifred Street, Dowlais.

Wales.—March 7.—For erection of a workmen's hall, institute and free library, at Cwmbach, Aberdare. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—March 15.—For erection of a church at Newbridge, Mon. Deposit 1*l*. 1*s*. Mr. John W. Aldiss, M.S.A., architect and surveyor, Newbridge, Mon.

Warlingham.—March 9.—For the following building work at the Croydon Mental Hospital, Warlingham, Surrey, viz.:—Extension of attendants' dining-room (female side). Deposit 1*l*. 1*s*. The Borough Engineer, Town Hall, Croydon.

Whitley Bay.—March 15.—For the erection of a council school to accommodate 600 scholars and a caretaker's dwelling-house. Deposit 2*l*. 2*s*. Apply by March 2 to Mr. C. Williams, secretary to the Northumberland Education Committee, Moothall, Newcastle-on-Tyne.

# TENDERS.

## BENINGTON.

For the erection of cottage and farm buildings at Benington, Lincs., for the Holland County Council.

| | | | |
|---|---|---|---|
| Richardson | £495 | 0 | 0 |
| Pett & Bondfield | 486 | 0 | 0 |
| Hodgson | 450 | 0 | 0 |
| Parker & Son | 429 | 0 | 0 |
| Barber, Boston (*accepted*) | 423 | 19 | 0 |

## DARTFORD.

For repairs to external roads at Joyce Green smallpox hospital, near Dartford, for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief.

| | | | |
|---|---|---|---|
| Road Maintenance and Stone Supply Co., Gravesend (*accepted*) | £299 | 19 | 9 |

For cleaning and painting work, &c., at the smallpox hospitals, for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief.

| | | | |
|---|---|---|---|
| Dyke | £1,500 | 0 | 0 |
| Jewell | 1,500 | 0 | 0 |
| Simms & Sons | 1,498 | 0 | 0 |
| Moseley | 1,480 | 0 | 0 |
| Ellingham | 1,387 | 0 | 0 |
| Barrett & Power | 1,089 | 0 | 0 |
| Vigor & Co. | 996 | 0 | 0 |
| Squire | 980 | 0 | 0 |
| Hussey | 979 | 0 | 0 |
| Kazak | 970 | 0 | 0 |
| Wright, Brixton Hill (*accepted*) | 907 | 10 | 0 |
| United Service Labour Brigade | 867 | 0 | 0 |
| Woollaston & Co. | 859 | 0 | 0 |

For removing and refixing corrugated iron roofing at the Orchard smallpox hospital. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief for the Metropolitan Asylums Board.

| | | | |
|---|---|---|---|
| Barrett & Power | £2,386 | 0 | 0 |
| Foster & Son | 2,203 | 13 | 3 |
| General Iron Foundry Co. | 1,650 | 0 | 0 |
| Ellingham | 1,584 | 0 | 0 |
| Hussey | 1,400 | 0 | 0 |
| Kazak | 1,035 | 0 | 0 |
| Jewell | 888 | 0 | 0 |
| Wood Bros., Forest Gate (*accepted*) | 666 | 10 | 0 |

## GORLESTON.

For erection of a block of four lock-up shops, Bells Road. Messrs. Cockrill & Cockrill, architects, Gorleston-on-Sea, near Great Yarmouth.

| | | | |
|---|---|---|---|
| Moore & Sons | £750 | 0 | 0 |
| Fleming | 720 | 10 | 0 |
| Wales | 715 | 0 | 0 |
| Woods (*accepted*) | 698 | 15 | 0 |
| Beach | 698 | 0 | 0 |
| Millichamp | 690 | 0 | 0 |
| Sheen | 689 | 18 | 0 |

## LAINDON.

For erection of a Council school at Laindon Hills, Essex. Mr. C. M. Shiner, A.R.I.B.A., architect, 10 John Street, Adelphi, W.C., and Grays, Essex.

| | | | |
|---|---|---|---|
| Brand | £2,464 | 19 | 6 |
| Wall & Co. | 2,187 | 2 | 0 |
| Spencer, Santo | 2,158 | 0 | 0 |
| Potter | 2,131 | 0 | 0 |
| Bruty | 2,077 | 0 | 0 |
| Dobson | 2,038 | 19 | 7 |
| Hammond & Miles | 1,951 | 0 | 0 |
| Hammond & Sons | 1,950 | 0 | 0 |
| Brown Bros. | 1,825 | 11 | 0 |
| Archer & Sons | 1,768 | 0 | 0 |
| Carter | 1,710 | 0 | 0 |
| Brown, Grays (*recommended*) | 1,700 | 0 | 0 |

## LISKEARD.

For painting, &c., the exterior of the Isolation Hospital, Groby Road. Mr. E. G. Mawbey, M.I.C.E., borough surveyor.

| | | | |
|---|---|---|---|
| Colman | £302 | 0 | 8 |
| Eyre | 299 | 14 | 9 |
| Snaith & Co. | 279 | 0 | 0 |
| Clark & Son | 260 | 6 | 4 |
| Fassett | 226 | 2 | 10 |
| A. & H. Freestone, Leicester (*accepted*) | 216 | 0 | 0 |

## LIVERPOOL.

For plumbing work, &c., at the Workhouse, Smithdown Road. Mr. Walter W. Thomas, architect, Liverpool.

| | | | |
|---|---|---|---|
| Jones | £163 | 0 | 0 |
| Henshaw Bros. | 151 | 0 | 0 |
| Hughes | 150 | 0 | 0 |
| Lee & Son | 142 | 10 | 0 |
| Beresford & Co. | 138 | 12 | 0 |
| Martin & Son | 126 | 10 | 0 |
| Fowler | 126 | 0 | 0 |
| Fraser & Son, Liverpool (*accepted*) | 120 | 0 | 0 |
| Griffiths & Son | 119 | 0 | 0 |

## LONDON.

For installation of electric lighting at Cow Lane School, Rotherhithe, for the London County Council.

| | | | |
|---|---|---|---|
| Checkogram (1908), Ltd. | £590 | 0 | 0 |
| British Westinghouse Electric and Manufacturing Co. | 401 | 0 | 0 |
| Simmonds Bros. | 372 | 0 | 0 |
| Glover & Co. | 340 | 0 | 0 |
| Stegman & Co. | 330 | 10 | 0 |
| Edmundson's Electricity Corporation | 317 | 0 | 0 |
| Fryer & Co. | 304 | 10 | 0 |
| Weston & Sons | 271 | 0 | 0 |
| Johnson & Phillips, Charlton (*recommended*) | 236 | 10 | 0 |

For structural improvement of the Great College Street School, St. Pancras.

| | | | |
|---|---|---|---|
| McCormick & Sons | £5,300 | 0 | 0 |
| Johnson & Co. | 5,163 | 0 | 0 |
| Downs | 4,987 | 0 | 0 |
| Williams & Son | 4,981 | 0 | 0 |
| Triggs | 4,963 | 0 | 0 |
| Soole & Son | 4,815 | 12 | 11 |
| Perry & Co. (Bow) | 4,814 | 0 | 0 |
| Patman & Fotheringham | 4,773 | 0 | 0 |
| Godson & Sons | 4,681 | 0 | 0 |
| Roberts | 4,674 | 0 | 0 |
| Allen & Sons | 4,649 | 0 | 0 |
| Kearley, Great Marlborough Street (*recommended*) | 4,541 | 0 | 0 |
| Architect's estimate | 4,887 | 0 | 0 |

For draining and tar-paving of the playgrounds at the Riversdale school, Wandsworth, and the erection of a schoolkeeper's house.

| | | | |
|---|---|---|---|
| Smith & Co. | £1,685 | 9 | 9 |
| Lole & Co. | 1,425 | 0 | 0 |
| Garrett & Son | 1,402 | 0 | 0 |
| Appleby & Sons | 1,371 | 0 | 0 |
| Soole & Son | 1,360 | 6 | 5 |
| Triggs | 1,347 | 0 | 0 |
| Hammond | 1,338 | 10 | 0 |
| Patrick, Wandsworth (*recommended*) | 1,329 | 0 | 0 |
| Architect's estimate | 1,495 | 0 | 0 |

For the erection of an engine house and for the execution of underground and other works for dealing with storm water in connection with the Abbey Mills pumping station enlargement.

| | | | |
|---|---|---|---|
| F. & H. F. Higgs | £78,714 | 0 | 0 |
| Coles | 77,737 | 0 | 0 |
| Kirk & Randall | 66,920 | 0 | 0 |
| Bentley & Son | 66,720 | 0 | 10 |
| Mowlem & Co. | 66,386 | 0 | 0 |
| Westminster Construction Co. | 65,132 | 2 | 9 |
| Dick, Kerr & Co. | 62,948 | 16 | 11 |
| Perry & Co. (Bow) (*recommended*) | 58,362 | 3 | 4 |
| Chief engineer's estimate | 70,300 | 0 | 0 |

## LYE.

For the erection of a new Council school for the Worcestershire Education Committee.

| | | | |
|---|---|---|---|
| Griffiths, Lye (*accepted*) | £4,934 | 0 | 0 |

## STOCKDALE.

For excavating, concreting and walling, in connection with diversion of River Ellen, and drainage works at Stockdale and Whitefield House. Mr. J. Graham, engineer, Carlisle.

| | | | |
|---|---|---|---|
| Beaty | £2,100 | 0 | 0 |
| Marshall & Co. | 1,657 | 5 | 0 |
| Routledge | 1,515 | 11 | 0 |
| Jackson | 1,476 | 0 | 0 |
| Exors. of J. Arundel | 1,452 | 9 | 7 |
| Braithwaite & Co. | 1,434 | 11 | 4 |
| Hyslop | 1,385 | 7 | 3 |
| Laing & Son | 1,268 | 17 | 0 |
| Dawson | 1,235 | 19 | 5 |
| Pickthall | 1,122 | 0 | 0 |
| Bushby & Sons, Leeds (*accepted*) | 1,086 | 9 | 0 |

## WALES.

For new school at Llanfair P.G., for the Anglesey education committee. Mr. J. Owen, county architect, Menai Bridge.

| | | | |
|---|---|---|---|
| Thomas | £3,468 | 0 | 0 |
| W. & O. Pritchard | 3,265 | 0 | 0 |
| Evans & Pritchard | 3,260 | 0 | 0 |
| R. & J. Williams | 3,153 | 0 | 0 |
| H. & J. Williams | 2,978 | 0 | 0 |
| Roberts & Williams | 2,954 | 0 | 0 |
| Hughes | 2,900 | 0 | 0 |
| Jones, Llanwnda (*accepted*) | 2,829 | 0 | 0 |

For erecting a detached house in Salisbury Road, Maesteg. Mr. E. Whitfield Burnett, architect, Maesteg.

| | | | |
|---|---|---|---|
| Williams | £1,428 | 0 | 0 |
| Price Bros. | 1,290 | 0 | 0 |
| Thomas & Co. | 1,288 | 0 | 0 |
| J. Lewis | 1,230 | 0 | 0 |
| Bowens & Davies | 1,098 | 0 | 0 |
| W. T. Lewis, Maesteg (*accepted*) | 1,090 | 0 | 0 |

For the proposed riding school, drill hall and headquarters, Port Talbot, for the Royal Horse Artillery. Mr. W. H. Dashwood Caple, F.R.I.B.A., architect, Cardiff.

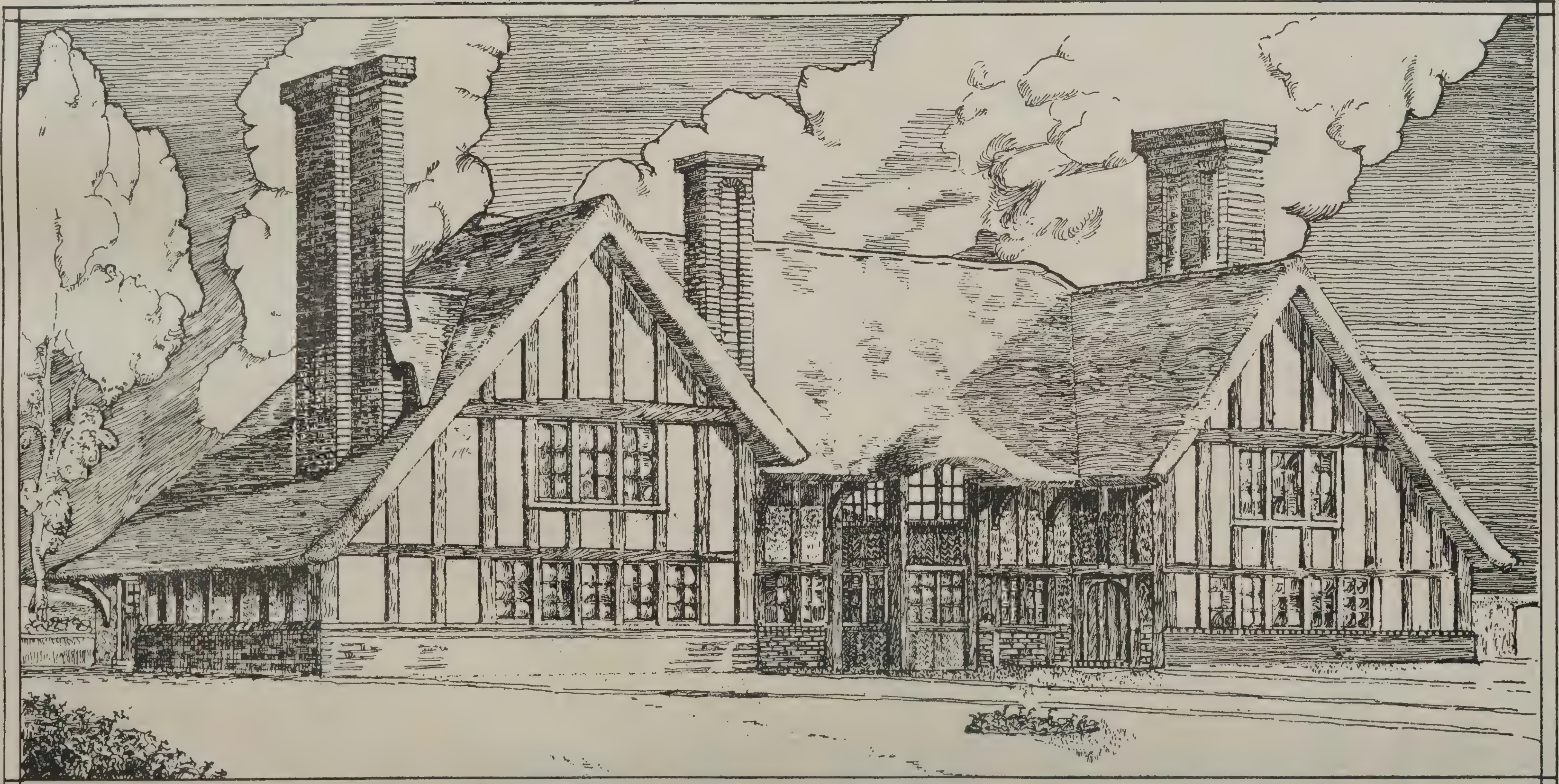
| | | | |
|---|---|---|---|
| Jenkins | £8,500 | 0 | 0 |
| D. Davies & Sons | 7,570 | 0 | 0 |
| Rankin | 7,351 | 0 | 0 |
| Gaylard | 7,270 | 0 | 0 |
| Waring, Cole & Waring | 7,135 | 0 | 0 |
| Williams | 6,999 | 0 | 0 |
| Morgan & Cox | 6,925 | 0 | 0 |
| Watt Bros. | 6,764 | 0 | 0 |
| Maggs & Co. | 6,750 | 0 | 0 |
| Stephens, Bastow & Co. | 6,594 | 0 | 0 |
| D. Davies | 6,435 | 0 | 0 |
| Smith | 6,414 | 0 | 0 |
| W. & J. R. Watson, Edinburgh and Neath (*accepted*) | 6,193 | 0 | 0 |

## WOODFORD.

For building rifle range, &c., for Messrs. Barclay, Perkins & Co. Mr. F. G. Newman, surveyor, Rotherhithe.

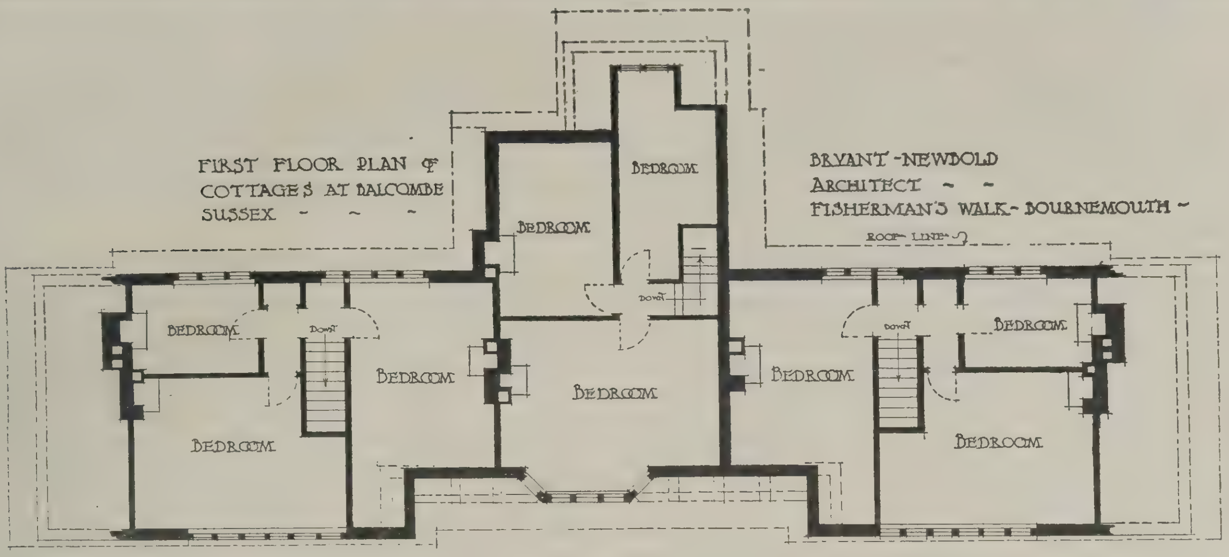
| | | | |
|---|---|---|---|
| Small & Sons | £298 | 0 | 0 |
| Maxwell Bros. | 276 | 0 | 0 |
| Rendall | 249 | 12 | 0 |
| Limn & Co. | 234 | 10 | 0 |
| Ranger & Son (*accepted*) | 209 | 0 | 0 |

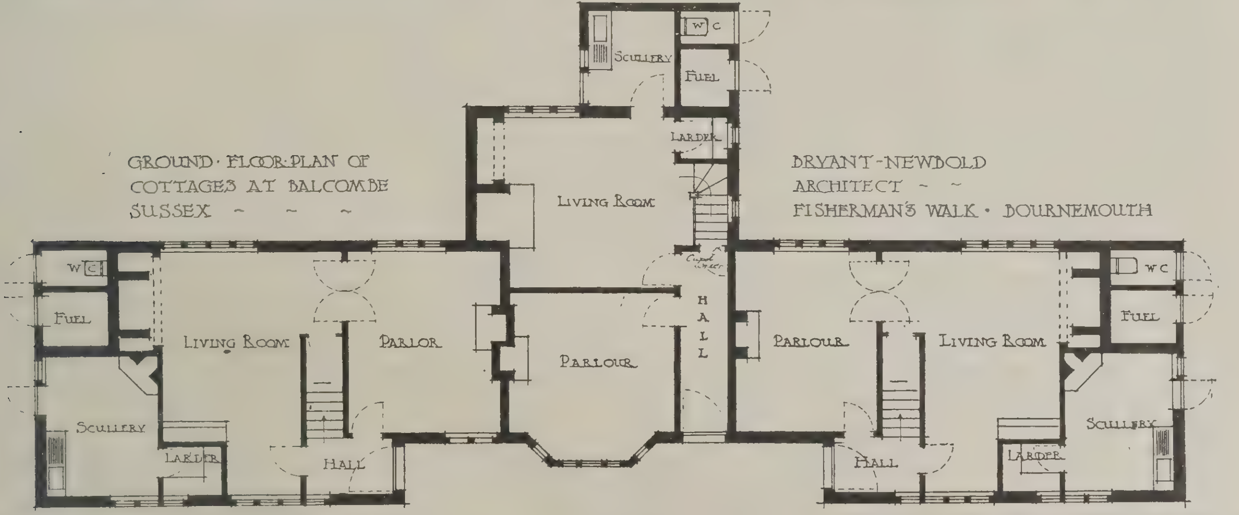
The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting on Thursday, February 17. Grants of money were made in aid of the following objects., viz. :—Building new churches at Dawdon, St. Hilda and St. Helen, County Durham, 150*l.* ; Loughborough, St. Peter, 100*l.* ; St. Albans, St. Paul, Herts, 200*l.* ; Woodford Bridge, St. Barnabas, Essex, 150*l.* ; Woolacombe, St. Sabinus, Devon, 100*l.*, and Friern Barnet, St. John, Middlesex, 70*l.* ; and towards enlarging or otherwise improving the accommodation in the churches at Barfreystone, St. Mary the Virgin, Kent, 10*l.* ; Birkenhead, St. Matthew, 60*l.* ; Pembrey, St. Illtyd, Carm., 80*l.* ; Scopwick, Holy Cross, near Lincoln, 25*l.* ; South Tottenham, St. Philip, Middlesex, 100*l.* ; and Lavenham, St. Peter and St. Paul, Suffolk, 50*l.* The following grants were also paid for works completed :—Dartford, Christ Church, Kent, 150*l.* ; Earby, All Saints, near Leeds, 50*l.* ; Gorton, St. Philip, Manchester, 90*l.* ; Abergavenny, Holy Trinity, Mon., 40*l.*, and Sutton-in-Ashfield, St. Michael and All Angels, Notts., 90*l.* In addition to this the sum of 250*l.* was paid towards the repairs of nineteen churches from trust funds held by the society.



PERSPECTIVE VIEW

COTTAGES AT BALCOMBE, SUSSEX.—Mr. Bryant Newbold, Architect.





## COTTAGES AT BALCOMBE, SUSSEX.

This group of cottages has been erected at Balcombe in one of the prettiest parts of Sussex. An effort has been made to bring the design into harmony with its rural setting, one of the means employed being the use of thatch as a roof covering. The architect was Mr. H. Bryant Newbold, of Bournemouth.

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The first annual general meeting of the Concrete Institute was held at the Royal United Service Institution, Whitehall, on February 17, the Right Hon. the Earl of Plymouth, C.B. (late First Commissioner of Works), President, in the chair, supported by Sir Henry Tanner, I.S.O., Mr. E. P. Wells, J.P., Hon. Treasurer, Mr. Wm. Dunn, F.R.I.B.A., and other members of Council. The result of the ballot for six vacancies on the Council was as follows:—Messrs. C. H. Colson, M.Inst.C.E., William Dunn, F.R.I.B.A., Professor Henry Adams, M.Inst.C.E., Messrs. William G. Kirkaldy, Assoc.M.Inst.C.E., J. S. E. de Vesian, M.Inst.C.E., and E. Fiander Etchells, F.Phys.Soc. The Hon. Treasurer thereupon read the annual report and accounts, the adoption of which was moved by the Earl of Plymouth, who dwelt on the satisfactory progress which the Institute had made. This was seconded by Sir Henry Tanner, who referred to the work of Mr. Edwin O. Sachs in the foundation of the Institute. Mr. F. E. Wentworth Sheilds, M.Inst.C.E., and Mr. E. Fiander Etchells, F.Phys.Soc., dealt at some length with the work of the Science Standing Committee. After the discussion of various matters of detail, Mr. William Dunn proposed, and Sir Henry Tanner seconded, a vote of thanks to the President for occupying the chair.

A well got-up little guide to the Black Forest has just appeared in print and contains also a description of the Rhine and Neckar and famous towns like Heidelberg and Baden-Baden. This profusely illustrated pamphlet will be sent gratis and post-free on application to the Internationales Offentliches Verkehrsbureau, Berlin, Unter den Linden 14.

Messrs. Wm. Potts & Sons, Ltd., clock manufacturers, Leeds and Newcastle, are making a new hour-striking clock for Selaby, near Darlington; also a memorial striking clock with large external copper dial, painted and gilt, for Arthington parish church, Leeds.

## COMPETITIONS.

Coventry.—The Coventry City Council on Tuesday agreed to organise a competition in order to obtain designs for municipal buildings with or without a town hall on a site belonging to the Council in Earl Street. There will be a supplementary plan for a town hall to be erected on the site of St. Michael's Baptist Chapel and some adjoining offices. The premiums will amount to 450*l*.

Saltburn.—The North Riding Education Committee recently invited designs for a girls' high school to be erected at Saltburn. It is now announced that the successful architects are Messrs. S. B. Russell & T. E. Cooper, 11 Gray's Inn Square, W.C., and that the twenty guineas premium has been awarded to Messrs. F. J. Eedle & Meyers, Railway Approach, London Bridge, London; and the ten guineas premium to Messrs. Robert Evans & Son, Eldon Chambers, Nottingham.

Peterborough.—The R.I.B.A. Competitions Committee, who have been in communication with the promoters of a competition for a proposed secondary school in Peterborough, report that they are now satisfied with the conditions of the competition.

Scotland.—The Kyles of Bute Hydropathic Company having decided to rebuild their establishment at Port-Bannatyne, recently destroyed by fire, have selected the following three Glasgow architects to compete:—Mr. George Bell, F.R.I.B.A.; Mr. A. Balfour, F.R.I.B.A., I.A.; and Messrs. Thompson & Sandilands, FF.R.I.B.A.

Warrington.—The design of Mr. T. A. Buttery has been selected in competition for the proposed schools in Evelyn Street.

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A joint report by the medical officer of health and the sanitary inspector for Leith has been issued, in which the almost universal employment of cisterns in the burgh is condemned as highly insanitary and unnecessary. They suggest therefore that the local authority should urge:—(1) That in all new buildings in Leith a supply from the main be provided in every house or other dwelling; (2) that a by-law be made and enforced by the Water Trust whereby a supply direct from the main will be made obligatory in all existing houses or other buildings; (3) that when supplies for drinking and culinary purposes are introduced from the main pipe, supplies from cisterns should not be insisted upon.

## MODERN INDO-EUROPEAN ARCHITECTURE.

AN interesting paper on "Art Administration in India" was read recently before the Indian section of the Society of Arts by Mr. E. B. Havell, who has acted as Principal of the Government School of Art at Madras and later of that at Calcutta, and is in a peculiarly advantageous position to discuss the subject. The attitude the author adopts is one of general hostility to the existing conditions as being extremely harmful to the native artistic instincts and traditions. Mr. Havell complains that a European standard of taste and manner has been introduced and established to the exclusion of indigenous art. One of the instances he gives is the architectural policy of the Public Works Department in India. On this subject he spoke as follows:—

I will turn to another official windmill against which I have been tilting with less success in the last twenty years—the architectural policy of the Public Works Department. It is hardly necessary to explain in detail its bearing upon the art administration of India. Mr. Cecil Burns, in the paper read before the Society of Arts last May, admitted that, as nearly all the decorative arts have originated from and are dependent upon the style of architecture they are intended to enrich, the decision to adopt European styles in Government and other buildings must exercise a powerful influence upon the practice of all the crafts allied to the building trade, and through them upon the teaching of the Schools of Art. Yet he was content to put this question, as well as the teaching of the fine arts, on one side, and to attribute the depressed condition of Indian handicraft chiefly to the opening of the Suez Canal. He considered that the arguments for and against the adoption of European styles in modern Indian buildings were sufficiently stated in a paper read before this Society, by Mr. T. Roger Smith, F.R.I.B.A., in 1873; and said that the question had been since fully considered in connection with the erection of the Queen Victoria Memorial building in Calcutta.

I will deal with Mr. Roger Smith's paper first. The gist of his arguments can be shown in a few short extracts. He says:—"Let us for consistency's sake be European in art; for art, if it be true, is an expression of national individuality more intense and more truthful than custom, fashion, or government. In the stubbornness with which we retain our nationality we resemble the Romans." This doctrine is more briefly expressed by Mr. Kipling's phrase, "East is East, and West is West, and never the twain shall meet." The stubbornness with which we have clung to this idea has been the main cause of our difficulties in India, but in art matters it is diametrically opposed to the principles which have been laid down by the Secretary of State, and nominally, at least, accepted by the Government of India.

Mr. Roger Smith goes on to state three reasons which might be brought forward for using an Indian style in Indian public buildings. "First, it is said that it is suited to the climate; secondly, that the natives can do it; and lastly, that it is, or can be, very beautiful. But," he added, "the sufficient answer, of course, is that it may be all these, but that it is not European, far less British. Of the three reasons alluded to, by far the most powerful is the one placed first, namely, that Indian architecture, whether Mohammedan or Hindu, is the offspring of the climate, and, as such, better fitted than anything we can import to the circumstances of the country. Very true, but so is Indian food, Indian dress, Indian living, Indian administration. They are all the offspring of the climate, yet we cling very naturally to the food, the dress, the manners, the principles of governing to which we are accustomed, though while we retain them in principle, we are not unwilling to make such variations in detail as will tend to diminish some of the inconveniences experienced in consequence of the peculiarity of the climate and *entourage*, leaving the question of encouraging the art of the country, in those cases where the building is devoted to the use of natives of the country, to stand on its own merits." You will observe that Mr. Roger Smith treats the matter of the preservation of Indian art as one of altogether inferior importance to that of nursing our own insular prejudices. But now he comes to the root of the matter. "The second reason for employing the styles of the country, namely, that the natives can design and build in them, is answered by the fact that the natives will not be employed. The buildings which are built for European use and with European funds in India have been invariably built under European supervision and from European designs, and always will be; and though the artificers employed may be natives, yet that does not make the buildings native works any more than the printing in Calcutta of an English book by Hindu compositors makes it a Hindu book."

The answer to what I must call this extraordinary argument simply is that there are no public buildings in India, built exclusively for European use and with European funds, and though *de facto* we have excluded Indian architects from the Public Works Department, it has never been laid down by official authority that they are always to be so excluded.

I do not think that any responsible British statesman of the present day would wish to argue that the design of public buildings in India must always remain in the hands of Europeans.

If we go back to the original reasons for the adoption of European styles in the Public Works Department it is easy to understand that very little, if any, consideration has ever been given to artistic principles; this policy was simply forced upon the department by the artistic and architectural ignorance of its officers. The designing of public buildings was for very many years placed in the hands of military officers or engineers, who had no training whatever in architecture as an art, and not even the archæological skill of the average European architectural draughtsman. The Macaulay doctrine established the departmental principle that bad European art was better than good Indian, so the Public Works officers, instead of using the architectural skill of the Hindu master-builders, as their Mogul predecessors did under similar circumstances, took their tee squares and set squares, and with the help of European archæological diagrams, made their paper designs for public buildings in the so-called "classic" style, their choice being mainly determined by the fact that this style presents fewer difficulties to the amateur architect than any other. Even to this day, this process of departmental routine is taught as architecture to Indian students, in all the engineering colleges of India by European professors of drawing and design, and these mechanical exercises enable the engineering graduate of the universities to oust the traditional master-builder from his hereditary and legitimate employment. The first results of these primitive archæological experiments by the Public Works officers were sometimes disastrous and dangerous to life and limb for the Indian workmen employed in executing them. Sometimes the buildings collapsed before they were completed, and accidents of a like nature are not altogether unknown even in the present day.

Occasionally, it must be admitted, the Public Works Department has set a better precedent, and among its officers there have been architects of skill, like Mr. Chisholm and Mr. Brassington in Madras, and Sir Swinton Jacob in Jaipur, who have successfully adapted Indian styles to departmental requirements. But they have hardly solved, as the Moguls did, the much more important problem of making full use of the traditional science and art of the Indian master-builder for the purposes of the State. And in this question of style every Viceroy, Governor, Head of Department, and every official architect has been a law to himself. No definite principle has been laid down, and the paramount importance of architectural style in relation to the preservation of Indian art and handicraft has never received the slightest official consideration, though, as one of the artistic advisers of Government, I have endeavoured on every possible occasion in the last twenty years to draw official attention to it.

Mr. Cecil Burns is entirely incorrect in his statement that the matter was fully considered in connection with the scheme for the Victoria Memorial at Calcutta. The facts are that at the first inception of the scheme for the memorial Lord Curzon invited public discussion and suggestions. The suggestion I submitted to Lord Curzon was that as a preliminary measure a competent architect should make a survey of buildings in Northern India constructed by living Indian master-builders who still carry on the traditions of Indian architecture, and that after this was done the design for the memorial should be made in a living Indian style in consultation with the best native master-builders that were found. This was very much the procedure which Shah Jahan adopted in connection with the building of the Taj. Lord Curzon engaged a competent architect, but did not carry out my main suggestion, to investigate thoroughly the living traditions of Indian architecture, for the reason that Calcutta was a European city, and that an Indian style of building would be unsuitable there.

I cannot myself conceive how it is possible to defend the Public Works policy on practical, æsthetic, or ethical grounds. The reasons given for it always seem to me to be pedantic, when they are not frankly philistine and indifferent to the interests of art. Let us suppose for a moment that there existed in England at the present day a large number of master-builders, masons, and other craftsmen who had at their fingers' ends all the architectural and craft traditions of the Middle Ages. Would architects and artists say that it was impossible, or undesirable, to employ these men in Government work because they did not know Latin and Greek, had no certificates from the Board of Education, and could not draw their designs on paper to an exact scale for the approval of the Local Government Board? And what would His Majesty's Opposition in the House of Commons say if, in the discussion on the Estimates, it was found that Government departments were sometimes employing architects, sculptors, and decorators from Calcutta for public buildings in London, and paying them ten, or twenty, or fifty times the rate of wages these English master-builders and craftsmen demanded, because the provincial English styles were not considered departmentally correct? In England such a situation is unthinkable, but it is actually the situation which has been considered right and proper for India during the last fifty years, and this is the situation which the art experts sent out by the Secretary of State to revive Indian art are asked to face. Is it surprising that they sometimes think discretion is the better part of valour?

Mr. Cecil Burns has, however, plenty of courage. He proposes that the School of Art lamb should die down with the Public Works lion, or, in other words, that the Principals of Schools of Art should accept things as they are, and cooperate with the Public Works Department in the decoration of public buildings. I myself have always strongly advocated such co-operation, provided that the security and free action of the lamb could be guaranteed, but I think the lamb is rash to thrust its head into the untamed lion's mouth. The system of co-operation was, in fact, as Mr. Chisholm stated in the discussion on Mr. Burns's paper, introduced by him when he was doing the double duties of Superintendent of the School of Arts and Consulting Architect in Madras. But directly I took charge of the School of Arts the Public Works Department withdrew its orders from the school and started workshops of their own. This is an illustration of the difficulties in which Principals of Schools of Art are placed. There is no fixed policy in art matters, and they have practically no voice in the settlement of artistic questions. Until it is the settled policy of the Government of India that living Indian styles shall be adopted as far as possible in all public buildings, there can be no co-operation between Art Schools and the Public Works Department for the advantage of Indian Art. The Principal of the School of Art is a subordinate official of the Education Department with a much inferior official status to that of the Consulting Architect, and if the latter chooses to have imitation Renaissance, or Gothic, or to invent a style of his own, for the design of public buildings, he is quite at liberty to do so.

Moreover, the Schools of Art are quite out of touch with the best Indian builders and decorators, and must always remain so if bound hand and foot by departmental authority.

## THE ART OF THE LEADWORKER.

THE Carpenters' Company are giving a valuable course of "Craft" lectures on Wednesday evenings at Carpenters' Hall, London Wall, E.C., and reports of them have appeared in our columns. The lecturer last week was Mr. Lawrence Weaver, who took as his subject "The Art of the Leadworker." A large number of fine specimens of English work were shown on the screen.

After commenting on the dignity of the calling, he said that the art of the leadworker was as living as it was individual. Its chief applications begin in architecture by being severely practical, as in roofing and water supply pipes. The next use was in objects which combined the useful and the decorative, such as fonts and pipe-heads. Finally, they reached the purely decorative in garden ornaments.

In the design of lead fonts the general character of the arcaded bowls with large figures admittedly resembles that of contemporary stone fonts. There is, however, a delicacy of modelling in the floral decoration and in the detail of the robes, combined with a general softness of effect, which would be impossible in stone. The fineness of detail might be obtained in marble, but it would be joined with a certain harshness, unavoidable in delicately wrought stone. There remains the alternative of bronze, but bronze calls for treatment more defined and less homely than suits the character of lead. Lead has a lower place, but it can take on a gentle dignity and simplicity incapable of transference to another material. Dealing with fonts, Mr. Weaver showed first the magnificent example at Walton-on-the-Hill, Surrey, which is one of eleven existing fonts having as chief feature a large arcade with prominent figures, presumably of the Apostles, generally twelve in number. The Ashover font has twenty figures in bold relief, simply draped and without mitre or nimbus. The example at Brookland, Romney Marsh, belongs to another class, for in addition to an arcade it has other important decoration. In this case there are two arcades, the upper one showing the signs of the zodiac, and the lower, figures illustrative of the labours of the months. The Pyecombe bowl dates about 1300, and marks the dawn of Gothic in the trefoil heads of the upper band of arcading. The Brundall bowl is the only one left in Norfolk, and is the only one that bears an image of the Crucifixion.

Rain-water heads are comparatively modern things. There is no historical evidence to anything of the kind earlier than 1241. The conservativeness of plumbers is often strikingly illustrated in the forms employed. Leadwork is frequently fifty years or more behind the stone-carving and plasterwork, so far as its design is concerned. The craftsmen were contented to follow the lines that their fathers had followed before them. Some of the wonderful interesting work at Haddon Hall is strongly mediæval, although the earliest there goes no further back than about 1580. This house epitomises the development of rain-water heads for over a century. The forty-seven at Knole Park, Sevenoaks, on the other hand, all date between 1604 and 1607. The twenty-nine different types not only touch the highest point of dcorative charm, but reach the limit of dexterous treatment. At Hatfield House there is a fine series of heads ranging from 1610. Several are very large, and two of the largest fit round the angles of the building and rest on the stone cornice, which is pierced so as to take the down-pipe. At the Abbot's Hospital, Guildford, there is a series of fourteen pipe-heads and pipes dating from 1627 to 1629. At St. John's College, Oxford, are four magnificent heads dating from 1630, which are conspicuous for their elaborate painting and gilding. They were recently restored by Mr. F. W. Troup from the traces left of the old colour.

The decorative problem of a rain-water cistern was not materially different from that of a font, but was quite unlike that of a pipe-head. At St. Fagan's Castle, Cardiff, is the earliest dated cistern. It stands 44 inches high, and is 20 feet in circumference. On the exterior there is a double row of arcaded panels, thirty out of the thirty-two being cast from the same pattern. It probably dates from 1620. The cisterns made in Devonshire and Somerset, in the late seventeenth and early eighteenth centuries, show a vigour which is absent from the London work of the same period. They were probably the work of the same plumber; they were certainly cast from the same or duplicate patterns. A typical London example is at the Record Office in Chancery Lane, near the doorway of the Rolls Chapel. London plumbers dotted the faces of their cisterns with shells and stars and stiff little goddesses. One of the most elaborate in England is at Lincoln's Inn. At Charlton House, Kent, there is an octagonal cistern placed on a lawn and effectively used as the base of a fountain.

Lead, said the lecturer, seemed the material *par excellence* for garden ornaments. But it was obvious that lead was not suitable for figures which required to be stayed with iron rods in consequence of not standing well over their bases. This disability was seen in equestrian figures and many others. For portrait statues it had the great recommendation of cheapness. The most satisfactory example extant of this class of work was that of Sir John Cass, made by Roubilliac in 1751; it now stands in the new Cass Foundation Institute, in Jewry Street, E.C. The oldest portrait bust in England is that of the great Lord Fairfax: it is now in the Council Chamber of the York Philosophic Society.

In nothing, declared Mr. Weaver, does lead take such a high place as in connection with spires—those symbols of Christian aspiration. The finest remaining spire, and the only one that has come to us without being restored, is at Long Sutton. Like many others, it was rendered conspicuously beautiful by the delightful texture of its surface, which has acquired with age a kind of white patina, such as could never be seen on stonework.

For the twenty-eight towers crowned with either spire or lantern by Wren, leaded timber was employed for nineteen and stone for only nine. His design for the top of the tower of St. Swithin's, in Cannon Street, is especially curious for the scooped-out splays at the junction of the tower and the octagonal spire. Other interesting examples of his great work in this direction are St. Martin's, Ludgate Hill; St. Augustine's, Watling Street; St. Margaret's, Lothbury; St. Edmund's, Lombard Street, and the lantern of St. Benet's, Paul's Wharf.

In the old days timber was used in the construction of towers because there was nothing else to use. Since then scientific progress has been made, and everywhere steel construction has been introduced. But there seems to be an almost universal feeling of shame in its use, and a desire for its concealment as far as possible. If the mediæval architect had had that material there is little doubt that we should have now leaded steel spires—*i.e.*, spires made up of steel ribs and lead filling. The last slide shown by Mr. Weaver was a leaded steel tower, designed by Sir Charles Nicholson, to illustrate the effect of such a combination.

## VARIETIES.

A second service reservoir is to be constructed by the Aberystwyth Town Council at a probable cost of 8,000*l*.

The work of completing St. Augustine's Church, Derby, by the building of a chancel, a vestry, and crypts, is to be proceeded with at once, at a cost of 3,700*l*.

The Princess Alice Hospital at Eastbourne is to be enlarged. It is estimated that about 3,500*l*. will be required for this purpose.

It has been decided after considerable delay to proceed with the Free Library and Art Gallery at Blackpool, which will cost about 18,000*l*.

Mr. Kitchen, architect to the Local Government Board, has prepared an official report emphatically condemning the workhouse infirmary at Bangor. He advises that a new infirmary should be erected on another site.

The Penrith Rural District Council have adopted a scheme prepared by Mr. J. Graham, Carlisle, for the water supply of their western district. It comprises two small reservoirs in Greystoke Park, and the cost is estimated at 20,000*l*.

Messrs. Siemens Bros., Ltd., have under consideration the desirability of making an important addition to their dynamo works in Stafford, which will provide employment for several hundred more workpeople. Plans have been prepared for a new section, which will comprise workshops and foundries.

Edinburgh School Board have instructed their architect to prepare plans for a new school on ground purchased from the city at M'Leod Street, off Gorgie Road, for 5,700*l*. The school, in which accommodation will be provided for about 1,200 pupils of twelve years of age or over, will cost, it is estimated, from 15,000*l*. to 20,000*l*.

Mr. B. T. Batsford will publish early in March a volume entitled "The Manor Houses of England," by the Rev. P. H. Ditchfield, M.A., F.S.A., and illustrated by Mr. Sydney R. Jones. It is intended to form a companion to the "Charm of the English Village," by the same authors, published two years ago. The book illustrates and describes in a popular manner the best typical examples of manor houses, many little known, and all the exterior and interior details which combine to give them lasting interest and attraction.

Mr. Fred. W. Albury, architect, Reading, has admitted into partnership Mr. H. Whiteman Rising, F.R.I.B.A., of Norfolk Street, W.C., and also Mr. E. P. Morgan, who has been in his office for the past twenty-five years. In future all communications should be addressed to Albury, Rising & Morgan, 154 Friar Street, Reading, or to the London Office, Oswaldestre House, Norfolk Street, Strand, W.C

Improved Service to the South of Germany and Trieste.—On and from May 1 the service *viâ* Harwich and the Hook of Holland will be greatly accelerated. Passengers, for instance, for Wiesbaden, Heidelberg, Stuttgart and Munich will arrive much earlier than hitherto, and through carriages will be run to these towns amongst others. Passengers for Trieste will be due to arrive at Munich 10.21 p.m., which will enable them to leave the same evening for Trieste, arriving there the following morning. In the direction to England the services from the towns above-mentioned will also be improved.

At last week's meeting of the Coventry Education Committee progress was made with the scheme for erection of a Council school in Centaur Road, Earlsdon. The buildings are to accommodate 1,200 children, and the cost is not to exceed 17,000*l*. Provision was also made for the enlargement of Stoke Council School, so as to afford accommodation for 1,200 children. Instructions were given to invite tenders for erection of a new school in Mile Lane, and the tender of Mr. A. J. Lord, of Wolston, to carry out the enlargement of Radford School at a cost of 3,930*l*. was accepted.

A faculty for carrying out a scheme for the extension of the Dudley parish church, at an estimated cost of 8,397*l*., has been issued. The chief works proposed are as follows:—To take down the eastern end, and extend the church eastward by the erection of a chancel, with north and east aisles and vestries, with an organ chamber over the latter; build a memorial chapel to seat seventy on the north side; construct a crypt to accommodate 200 underneath the chancel. The plans have been prepared by Messrs. Chatwin & Sons, architects, Birmingham.

The Tyne Improvement Commissioners are about to appoint a chief engineer over their various pier, river, and dock works, in succession to the late Mr. James Walker, M.I.C.E. Applications from candidates will be received up to March 3. The engineer will be responsible for the designing and execution of all the engineering works of the Commissioners. He will devote himself exclusively to the service of the Commissioners, and reside in the district. The salary is 1,500*l*. per annum. No application will be considered from any candidate over fifty years of age. Each candidate must state whether or not he is a practical diver.

The Building Acts committee of the London County Council desire that, to secure prompt action with regard to applications under section 22 (34) of the London County Council (General Powers) Act, 1909, the Council should delegate to them its authority under that sub-section, by which the Council is empowered to waive or modify certain of the requirements contained in the section as to the erection of buildings of iron or steel skeleton construction, the object of the sub-section being to facilitate the erection of such buildings. It is recommended "That paragraph 3 of the reference to the Building Acts committee be amended by the insertion after the words 'London Building Acts Amendment Act, 1905,' of the words 'and section 22 (34) of the London County Council (General Powers) Act, 1909.'"

A quarterly general meeting of the Glasgow Institute of Architects was held last week in the secretary's chambers, 115 St. Vincent Street, Mr. George Bell, F.R.I.B.A., president, in the chair. Reference was made to the death of Mr. Alexander Petrie, who had been a member of the Institute since 1874, had held the office of treasurer from 1890 till 1898, and had been vice-president from 1898 till 1902. The recommendation that the Council should take steps towards the better regulation of competitions promoted within its province, which was remitted to the Council by an extraordinary meeting of the Institute, had been held over meantime in view of the action of the Royal Institute in regard to the matter. A suggestion by the Glasgow Master Brickmakers' Association that there should be a uniform thickness of brick in the trade had been considered, and the suggested standard thickness of three inches had been approved of. The Council had under consideration the conditions of the competitions promoted by the Kyles of Bute Hydropathic Company and the Dumbarton School Board, and representations were made regarding amendment of the conditions in both cases. It had been arranged to hold an exhibition of designs submitted by Glasgow architects in the competition for the National Museum of Wales.

The East and West Molesey Urban District Council met for the purpose of again considering the acceptance of a tender for the erection of an isolation hospital. At a previous meeting in committee it was felt that the tender of Mr. E. Potterton, a local builder, should be accepted, but as this was not the lowest it was decided to approach the Local Government Board on the subject. The report of the Isolation Hospital Committee recommended the acceptance of the tender of Messrs. J. Appleby & Sons, of Southwark Park, S.E., whose figure was 3,336*l*. The Clerk reported that, as instructed, he had seen one of the assistant secretaries of the Local Government Board and explained why the Council wished to give the contract to Mr. Potterton. The assistant secretary, however, advised that they should accept the lowest tender, as acting in the way suggested was open to jobbery and malpractices. He also pointed out that, if the Council did not accept the lowest tender, people outside would not tender in the future, and the Council would be left in the hands of the local builder. He promised to give a written answer if Mr. Cann, the Clerk, stated the case in a letter. Mr. Cann read the letter he sent, from which it appeared that, after the committee had decided to recommend the acceptance of Messrs. Appleby's tender, Mr. Potterton obtained particulars of the tenders, and undertook, if his tender could be accepted, to reduce his price by 200*l*. He also promised to put the local unemployed on the work. Mr. Cann pointed out that there was a great deal of unemployment in the district. In the reply of the Local Government Board occurred the following sentence:—"I am to state that if, on the grounds mentioned in your letter alone, the District Council were to accept a tender other than the lowest, the Board would not be prepared to sanction a loan in excess of the lowest tender." The report of the committee was eventually adopted, and it was decided to apply for a loan of 3,248*l*. 4*s*. 10*d*.

THE
# Architect and Contract Reporter.
FRIDAY, MARCH 4, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No. 4725 Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 COLMORE ROW.

⁂ *Entered in the United States of America as second-class matter.*

AGENTS FOR AMERICA:

*The International News Co., 5 Bream's Buildings, Chancery Lane, London, England, and New York.*

AGENTS FOR CANADA:

*Messrs. WM. DAWSON & SONS, Ltd., Manning Chambers, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.*

*Subscription $5.20.*

AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

*Messrs. GORDON & GOTCH, Melbourne, Sydney, Brisbane, and Perth, Australia; Wellington, Christchurch, and Auckland, New Zealand; Launceston and Hobart, Tasmania.*

SOUTH AFRICA: *Central News Agency, Ltd.*

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**Under no circumstances whatever can the Proprietors of this journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

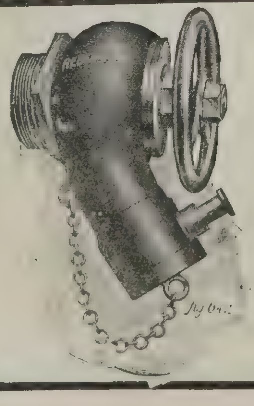
BLYTH.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

SCOTLAND.—March 21.—The Renfrew Parish Council invite plans and estimates for offices to be erected at Blawarthill, Yorker Road, near Scotstoun West Station. Deposit 10*s*. No premium. The Clerk to the Council, 1 Manse Street, Renfrew.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Will be returned to those who send plans to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

WALSALL.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

THE Town Council of Stirling have declined the offer of a colliery firm to work a trial lease of the coal underneath the town's lands at Winchelhaugh and the Raploch village, to the west of the town. One of the reasons for the refusal is that the famous view from Stirling Castle would be destroyed by the presence of a coal pit in the immediate foreground.



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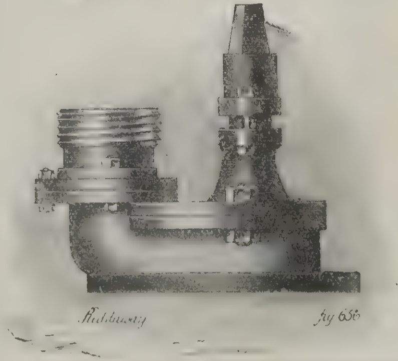

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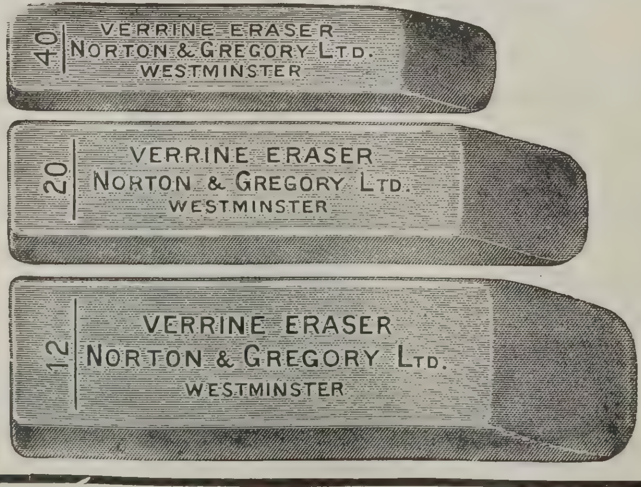

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## CONTRACTS OPEN.

Altrincham.—March 17.—For erection of a county secondary school for boys. Deposit 2*l*. 2*s*. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Bilston.—March 14.—For alterations to the Assembly Room and approaches at the Town Hall. Mr. V. Turner, A.M.I.C.E., engineer and surveyor, Town Hall, Bilston.

Braintree.—March 12.—For re-laying the wood block floors of the mixed department of the Bocking End Council school. Mr. J. Gleave, clerk, Education Office, County High School, Braintree, Essex.

Chapmanslade.—March 12.—For erection of a villa at Chapmanslade, Wilts. Mr. W. Cecil Glass, architect, 9 The Bridge, Frome, Somerset.

Chester.—March 14.—For new female epileptic ward at the Upton Asylum. Deposit 1*l*. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Darlington.—March 8.—For erecting offices at Stooperdale for the North Eastern Railway Locomotive Department. Mr. William Bell, architect to the North Eastern Railway, York.

Edenbridge.—April 6.—For the erection of a school to accommodate 200 children. Deposit 1*l*. Apply by March 10 to Mr. F. W. Crook, secretary to the Kent Education Committee, Caxton House, S.W.

Exeter.—March 7.—For additions and alterations at St. Luke's College, Heavitree Road. Mr. James Jerman, F.R.I.B.A., 1 Bedford Circus, Exeter.

Exmouth.—March 14.—For erection of detached house near Woodbury Road station. Mr. Ernest E. Ellis, architect, Exmouth.

Exmouth.—March 9.—For erection of the new Children's Seaside Home. Deposit 2*l*. 2*s*. Send names by March 9 to Mr. Ernest E. Ellis, architect, Exmouth.

Exmouth.—March 8.—For alterations and additions at the Exmouth Cottage Hospital. Mr. Ernest E. Ellis, architect, Exmouth.

Fareham.—March 5.—For erection of stabling for four horses, harness-room, van shed, &c. Deposit 3*l*. 3*s*. Forward names by March 5 to Mr. Wilberforce Cobbett, Fareham, Hants.

Gateshead.—March 31.—For erection of the Brighton Avenue new school. Deposit 1*l*. 1*s* Mr. F. W. Purser, architect, West Street, Gateshead.

Halifax.—March 7.—For the mason, joiner, plumber, slater and plasterer, and electrician works required in the alteration of the old Riding School, Halifax, into an electric theatre. Messrs. Richard Horsfall & Son, architects and surveyors, 22a Commercial Street, Halifax.

Hedworth.—March 11.—For the addition of a chancel, &c., to Hedworth Church, near Brockley Whins station. Plans and specifications can be seen on application at the Vicarage. Mr. W. Morton, quantity surveyor, 45 John Street, Sunderland.

Hebden Bridge.—March 5.—For the works required in erection of extensions to Hope Baptist school, Hebden Bridge. Send in names before noon on March 5 to Messrs. Sutcliffe & Sutcliffe, F.S.I., M.R.S.I.; architects, Hebden Bridge.

Hetton-le-Hole.—March 9.—For erection of a Council chamber and offices. Mr. John Harding, surveyor, Township Offices, Hetton-le-Hole.

Huddersfield.—March 9.—For erection of an elementary school at Birkby. Deposit 2*l*. 2*s*. Mr. K. F. Campbell, M.I.C.E., M.I.E.E., borough engineer, 1 Peel Street, Huddersfield.

Hull.—March 5.—For the erection of barrack buildings, &c., on the Anlaby Road and at Walton Street, for the East Riding Territorial Force Association. Deposit 2*l*. 2*s*. Apply by March 5 to Messrs. Wellsted, Dossor & Wellsted, City Square, Hull.

Hull.—March 14.—For the erection of a school in Southcoates Lane. Deposit 2*l*. 2*s*. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Hurst (Berks.).—March 9.—For erection of a small holding dwelling house and farm buildings on Church Farm, Hurst, for the Small Holdings and Allotments Committee of the Berkshire County Council. The County Land Steward's Office, Assize Courts, Reading.

Hurst.—March 11.—For erection of a new elementary school for 150 scholars, at Hurst, near Ashton-under-Lyne, Lancashire. Deposit 2*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Ireland.—March 21.—For the re-building of the Guildhall, Londonderry, for the Corporation. The City Architect, Municipal Offices, Foyle Street, Londonderry.

Ireland.—March 14.—For the erection of workmen's dwellings in Kilmainham, for the Dublin Corporation. Deposit 2*l*. The City Architect, Municipal Buildings, Cork Hill, Dublin.

Lincoln.—For erection and completion of two Wesleyan ministers' houses in Pennel Street. Mr. A. E. Lambert, architect, 28 Park Row, Nottingham

London.—March 8.—For plastering work in the "E and F" ward at the Sick Asylum, Devons Road, Bromley-by-Bow, London, E., for the Managers of the Poplar and Stepney Sick Asylum District. The Engineer and Superintendent of Labour at the Asylum.

London.—March 8.—For erection of 34 cottages at Tottenhall Road, Palmer's Green, N., for the Southgate Urban District Council. Deposit 2*l*. Mr. C. G. Lawson, surveyor, the Council Offices, Palmer's Green.

London.—March 10.—For alterations at the infirmary in Bancroft Road, Mile End, E., for the Guardians of Mile End Old Town. Mr. Benjamin Catmur, clerk, Bancroft Road, Mile End, E.

London.—March 16.—For the construction and erection of public baths at Western Road, for the Wood Green Urban District Council. Deposit 5*l*. at the Clerk's Office. Mr. Harold Burgess, architect, Capel House, 62 New Broad Street, E.C.

Manchester.—March 9.—For erection of a dwarf wall and screen in connection with the covered passage at the Workhouse at Crumpsall. Deposit 10*s*. 6*d*. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

Mexborough.—March 14.—For erection of six almshouses and other works incidental thereto at Church Street. Deposit 1*l*. Mr. G. Fenwick Carter, C.E., surveyor, Council Offices, Mexborough.

North Shields.—March 16.—For erection of North Shields telephone exchange, for the Commissioners of H.M. Works and Public Buildings. The Postmaster, North Shields.

Oldham.—For erection and completion of 24 houses, Hillside Avenue, Clarksfield. Deposit 1*l*. 1*s*. Mr. F. Thorpe, architect, 7 Clegg Street, Oldham.

Scotland.—March 8.—For alterations to the Swinton parish church, Duns. Deposit 10*s*. Mr. T. P. Marwick, architect, 43 York Place, Edinburgh; or Mr. A. D. Walker, School House, Swinton, Duns.

Scotland.—March 12.—For mason, carpenter, slater, plaster, plumber, painter and glazier works of laundry and art class-rooms at Buckie public school, for the Rathven School Board. Mr. R. Y. Mackay, Clerk to the School Board.

Scotland.—March 14.—For the mason and brickwork, carpenter and joiner, glazier, slater, plasterer, plumber, smith, and painter's work for erection of hall and houses at Windygates. Deposit 1*l*. 1*s*. Mr. G. Charles Campbell, architect and surveyor, Methil.

Sheffield.—March 14.—For the whole of the works required in erection of new infant department for 468 places at Owler Lane Council school. The City Architect, Town Hall, Sheffield.

Shrewsbury.—March 7.—For alterations to and extension of the existing pavilion at Meole Brace, for the Shrewsbury Golf Club. Mr. Livesey, St. John's Hill, Shrewsbury.

Sowerby Bridge.—March 14.—For the mason and bricklayer, carpenter and joiner, slater and plasterer, plumber and glazier, cast-iron and steel, concretor and painter work required in erection of a five-storey cotton mill, Walton Street. Mr. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

St. Helens.—March 21.—For erection of a school in North Road. Deposit 1*l*. 1*s*. Mr. Frank S. Biram, architect, George Street, St. Helens, Lancs.

Wales.—For erection of two houses at Glyn Cory Garden Village, Peterstone. Mr. Wm. R. Jackson, 18 Queen Street, Cardiff.

Wales.—March 7.—For erection of a workmen's hall, institute and free library, at Cwmbach, Aberdare. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—March 9.—For the following works, for the Glamorgan County Council, viz. :—(1) New infants' department at the Council school at Three Crosses, near Swansea; (2) additions and alterations at Port Talbot eastern boys' and girls' school; (3) levelling playground at Tynyrheol school (Garw Valley); (4) formation of roads, &c., for Tirphil school. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—March 14.—For erection of a Council school, to accommodate 600 children, at Crumlin, Mon. Deposit 2*l*. 2*s*. Mr. John Bain, architect, County Council Offices, Newport.

Wales.—March 15.—For erection of a church at Newbridge, Mon. Deposit 1*l.* 1*s.* Mr. John W. Aldiss, M.S.A., architect and surveyor, Newbridge, Mon.

Wales.—March 15.—For alterations and additions to the Raglan Police Station, Monmouth. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Newport, Mon.

Warlingham.—March 9.—For the following building work at the Croydon Mental Hospital, Warlingham, Surrey, viz.:—Extension of attendants' dining-room (female side). Deposit 1*l.* 1*s.* The Borough Engineer, Town Hall, Croydon.

Workington.—March 18.—For the various works required in extensions to the drill hall, Edkin Street. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

## TENDERS.

### BELFAST.

For carrying out the following works, viz.:—(1) Dining hall, work room and dormitories; and (2) dormitories for infirm inmates, for the Guardians.

*Contract No. 1.*

| | | | |
|---|---|---|---|
| Kidd | £7,500 | 0 | 0 |
| Laverty & Sons | 7,037 | 0 | 0 |
| J. & W. Stewart | 6,963 | 0 | 0 |
| Corry | 6,900 | 0 | 0 |
| Keith | 6,830 | 0 | 0 |
| Henry & Sons | 6,739 | 0 | 0 |
| McAnley | 6,500 | 0 | 0 |
| Dowell & Co. | 6,494 | 0 | 0 |
| Campbell & Sons | 6,432 | 12 | 10 |
| McRoberts & Armstrong | 6,376 | 12 | 4 |
| Courtney & Co. | 6,370 | 0 | 0 |
| Graham | 6,360 | 0 | 0 |
| J. & R. Thompson | 6,356 | 0 | 0 |
| Hogg | 6,196 | 0 | 0 |
| Thornbury Bros. | 5,998 | 0 | 0 |
| McLaughlin & Harvey | 5,699 | 0 | 0 |
| Dowling, Belfast (*accepted*) | 5,562 | 0 | 0 |

*Contract No. 2.*

| | | | |
|---|---|---|---|
| Kidd | 4,940 | 0 | 0 |
| Corry | 4,500 | 0 | 0 |
| Keith | 4,400 | 0 | 0 |
| J. & W. Stewart | 4,336 | 0 | 0 |
| Laverty & Sons | 4,333 | 0 | 0 |
| Henry & Sons | 4,225 | 0 | 0 |
| Campbell & Son | 4,100 | 8 | 2 |
| Dowell & Co. | 4,077 | 0 | 0 |
| McAnley | 4,050 | 0 | 0 |
| Graham | 4,017 | 0 | 0 |
| Courtney & Co. | 3,980 | 0 | 0 |
| J. & R. Thompson | 3,962 | 0 | 0 |
| Hogg | 3,952 | 0 | 0 |
| McLaughlin & Harvey | 3,920 | 0 | 0 |
| McRoberts & Armstrong | 3,856 | 2 | 6 |
| Thornbury Bros. | 3,745 | 0 | 0 |
| Dowling (*accepted*) | 3,516 | 15 | 10 |

### BRADFORD.

For erecting a warehouse and alterations in Lister Hills Road. Mr. Edgar H. Parkinson, architect, Bradford.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Bentley, mason | £1,260 | 0 | 0 |
| Parker, joiner | 548 | 0 | 0 |
| Wright, plumber | 125 | 0 | 0 |
| Hargreaves, plasterer | 115 | 0 | 0 |
| Hanson, painter | 35 | 0 | 0 |
| Nelson, slater | 13 | 0 | 0 |

All of Bradford.

### BROADSTAIRS.

For Home of Rest, Stone Road. Mr. W. Leonard Dowton, architect, 1 Great James Street, Bedford Row, W.C., and Broadstairs.

| | | | |
|---|---|---|---|
| Holbourn | £1,250 | 0 | 0 |
| Miriams | 1,240 | 0 | 0 |
| Goodburn | 1,200 | 0 | 0 |
| Philpott | 1,197 | 10 | 0 |
| May | 1,182 | 0 | 0 |
| Denne & Son | 1,160 | 0 | 0 |
| Martin | 1,125 | 0 | 0 |
| White, Ramsgate (*accepted*) | 1,028 | 0 | 0 |

### CAMBRIDGE.

For construction of a road (about 1,100 yards in length) on the Madingley Road Building Estate. Messrs. J. Carter Jonas & Sons, surveyors, Cambridge.

| | | | |
|---|---|---|---|
| Woods & Sons | £4,372 | 8 | 3 |
| Willmott & Sons | 4,238 | 17 | 0 |
| Coulson & Lofts | 4,047 | 0 | 0 |
| Mornement & Ray | 3,922 | 17 | 1 |
| W. Bell & Sons | 3,860 | 0 | 0 |
| Trueman | 3,795 | 10 | 8 |
| Jewell | 3,756 | 6 | 11 |
| G. Bell & Sons | 3,646 | 0 | 0 |
| Kidman Bros. | 3,626 | 6 | 8 |
| H. & A. Swann Bros. | 3,610 | 18 | 8 |
| Palmer | 3,575 | 0 | 0 |
| Negus & Sons, Cambridge (*accepted*) | 3,557 | 14 | 1 |
| Williams | 3,545 | 14 | 2 |
| Howes | 3,528 | 0 | 0 |
| Hinkins & Sons | 3,453 | 2 | 0 |

### CHESTER-LE-STREET.

For constructing a sewer at Pelton.

| | | | |
|---|---|---|---|
| Rutherford | £474 | 0 | 0 |
| Bell | 345 | 0 | 0 |
| Friend & Co. | 311 | 0 | 4 |
| Wear & Son | 285 | 10 | 0 |
| Henderson | 263 | 10 | 0 |
| Johnson & Strong | 246 | 19 | 8 |
| Armstrong | 242 | 1 | 6 |
| Carrick (*accepted*) | 237 | 11 | 9 |

### CLIFFORD.

For additions and alterations to the Council school at Clifford, near Hay, Herefordshire. Mr. G. H. Jack, county architect and surveyor.

| | | | |
|---|---|---|---|
| Rowberry | £1,417 | 15 | 0 |
| Evans | 1,256 | 10 | 0 |
| Watkins & Son | 1,238 | 0 | 0 |
| Wilks & Son | 1,179 | 0 | 0 |
| Beavan & Hodges | 1,158 | 10 | 0 |
| James | 1,145 | 10 | 0 |
| Cooke | 1,125 | 0 | 0 |
| Bowers & Co. | 1,060 | 0 | 0 |
| Powell & Son, Hereford (*accepted*) | 1,051 | 0 | 0 |
| County Surveyor's estimate | 1,040 | 0 | 0 |

### ELTHAM.

For the erection of a parish hall. Messrs. Moscrop-Young & Glanfield, 20 Brook Street, and Mr. Percy J. Waldram, M.S.I., 12 Buckingham Street, joint architects.

| | | | |
|---|---|---|---|
| Jones & Andrews | £2,382 | 0 | 0 |
| Blay | 2,375 | 0 | 0 |
| Thomas & Edge | 2,306 | 0 | 0 |
| Smith & Sons | 2,297 | 0 | 0 |
| F. & H. F. Higgs | 2,268 | 0 | 0 |
| Knight | 2,267 | 0 | 0 |
| Holloway | 2,243 | 0 | 0 |
| Grover & Sons (*accepted*) | 2,242 | 0 | 0 |

### HARPENDEN.

For erection of a private house, Ragdale, Park Avenue, Harpenden, Herts. Messrs. S. & A. Salisbury, M.S.A., architects, Harpenden.

| | | | |
|---|---|---|---|
| Miskin & Sons | £2,184 | 0 | 0 |
| Dunham | 2,000 | 0 | 0 |
| Salisbury & Son | 1,990 | 0 | 0 |
| Phillips & Blake | 1,893 | 0 | 0 |
| Dumpleton | 1,868 | 0 | 0 |
| Jarvis, Harpenden (*accepted*) | 1,740 | 0 | 0 |

### HINTON.

For the erection of a school for the Gloucestershire education committee.

| | | | |
|---|---|---|---|
| Walters & Son, Bristol (*accepted*) | £2,667 | 0 | 0 |

### LINCOLN.

For erection of a public elementary school on Spring Hill. Mr. W. G. Watkins, architect, Lincoln.

| | | | |
|---|---|---|---|
| Bosworth & Lowe | £5,157 | 0 | 0 |
| Maule & Co. | 5,130 | 0 | 0 |
| Messom | 4,980 | 0 | 0 |
| Close & Sons | 4,859 | 0 | 0 |
| Hedley | 4,737 | 0 | 0 |
| Hockley & Co. | 4,662 | 10 | 0 |
| Parker & Co. | 4,570 | 0 | 0 |
| Wright & Son | 4,545 | 0 | 0 |
| Scarborough | 4,497 | 14 | 0 |
| Pattinson & Sons | 4,470 | 0 | 0 |
| Brown & Son | 4,465 | 0 | 0 |
| Harper, Carlton, Notts (*accepted*) | 4,108 | 0 | 0 |

## LONDON.

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the construction, on the underground conduit system of electric traction, of the authorised tramways from (1) Streatham *viâ* Mitcham Lane and Southcroft Road, to Tooting Junction; and (2) Garratt Lane, *viâ* Wimbledon Road, to the county boundary. The tenders also contain provision for paving works outside the tramway tracks in connection with widenings of Mitcham Lane and Southcroft Road.

| | Tramway Works. | | Paving Works. | | Total. | |
|---|---|---|---|---|---|---|
| Coles | £38,659 | 6 | £4,095 | 2 | £42,754 | 9 |
| Mowlem & Co. | 38,111 | 19 | 4,410 | 19 | 42,522 | 18 |
| Manders | 37,852 | 16 | 4,600 | 8 | 42,453 | 5 |
| Dick, Kerr & Co. | 36,729 | 18 | 4,427 | 8 | 41,157 | 6 |
| Kirk & Randall, Woolwich (*recommended*) | 35,795 | 5 | 4,087 | 15 | 39,883 | 0 |
| Chief Engineer's estimate | 37,375 | 6 | 4,576 | 12 | 41,951 | 19 |

For cleaning and painting of L.C.C. Council Schools.

*Fulham: Everington Street.*

| | | | |
|---|---|---|---|
| Lapthorne & Co. | £888 | 10 | 0 |
| Bendon | 881 | 0 | 0 |
| Hide | 865 | 0 | 0 |
| Roberts & Co. | 850 | 0 | 0 |
| Polden | 830 | 0 | 0 |
| Johnson | 746 | 0 | 0 |
| Patrick | 738 | 0 | 0 |
| Brown & Sons | 698 | 16 | 0 |
| Johnson & Co. | 539 | 0 | 0 |
| Lole & Co., Chelsea (*recommended*) | 519 | 0 | 0 |

*Fulham: Langford Road.*

| | | | |
|---|---|---|---|
| Johnson & Co. | 734 | 0 | 0 |
| Lole & Co. | 730 | 0 | 0 |
| Patrick | 690 | 0 | 0 |
| Carmichael | 683 | 0 | 0 |
| Triggs, Clapham (*recommended*) | 506 | 0 | 0 |

*Hampstead: Netherwood Street.*

| | | | |
|---|---|---|---|
| Ford & Walton | 749 | 0 | 0 |
| Lea | 739 | 0 | 0 |
| Staines & Co. | 727 | 0 | 0 |
| Allen & Sons, Kilburn (*recommended*) | 679 | 0 | 0 |

*Islington: Caledonian Road.*

| | | | |
|---|---|---|---|
| Mason & Co. | 1,088 | 0 | 0 |
| Hawkins & Sons | 763 | 0 | 0 |
| Roome & Co. | 739 | 10 | 0 |
| Wallis & Sons | 737 | 0 | 0 |
| Reason | 729 | 0 | 0 |
| Spencer, Santo & Co. | 676 | 0 | 0 |
| Patman & Fotheringham | 672 | 0 | 0 |
| Sims | 669 | 0 | 0 |
| Williams & Son, Barnsbury (*recommended*) | 647 | 0 | 0 |

*Islington: Yerbury Road.*

| | | | |
|---|---|---|---|
| Wallis & Sons | 302 | 0 | 0 |
| Staines & Co. | 758 | 0 | 0 |
| Patman & Fotheringham | 737 | 0 | 0 |
| Stewart | 734 | 10 | 0 |
| McCormick & Sons | 688 | 0 | 0 |
| Marchant & Hirst | 663 | 0 | 0 |
| Roberts & Co., Highbury (*recommended*) | 651 | 0 | 0 |

For remetalling the western roadway of the Metropolitan Cattle Market, for the City Corporation.

| | | | |
|---|---|---|---|
| Mowlem & Co. | £460 | 0 | 0 |
| Parry & Co. | 392 | 0 | 0 |
| Anderson | 390 | 0 | 0 |
| Griffiths & Co. (*accepted*) | 352 | 0 | 0 |

For alterations at Windsor Lodge, Linden Grove, Peckham. Mr. W. L. Dowton, architect, 1 Great James Street, Bedford Row.

| | | | |
|---|---|---|---|
| Mattock & Parsons | £313 | 0 | 0 |
| Hollingsworth | 269 | 0 | 0 |
| Courtney & Fairbairn | 237 | 0 | 0 |
| Pearson | 227 | 0 | 0 |
| Sheffield | 204 | 0 | 0 |
| Champion & Son | 185 | 0 | 0 |
| Allen, Penge (*accepted*) | 159 | 15 | 0 |

## PONTEFRACT.

For borehole works, for the Corporation. Messrs. G. & F. W. Hodson, engineers, Loughborough.

| | | | |
|---|---|---|---|
| Timmins & Sons | £2,167 | 6 | 6 |
| Thom | 2,113 | 11 | 9 |
| Potter & Co., London (*accepted*) | 2,108 | 3 | 9 |

## SCOTLAND.

For the erection of a new swimming bath at the central establishment, Dundee.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| G. H. Nicoll & Co., tiler | £958 | 0 | 3 |
| Crichton & Son, plumber | 783 | 13 | 3 |
| Reoch, plasterer | 229 | 0 | 0 |

## SHEFFIELD.

For erecting additional buildings at Collegiate Hall.

| | | | |
|---|---|---|---|
| Freckingham & Sons (*accepted*) | £9,850 | 0 | 0 |

For the whole of the work of extending and altering the Training College buildings.

| | | | |
|---|---|---|---|
| Freckingham & Sons (*accepted*) | £5,875 | 0 | 0 |

## SOUTHEND-ON-SEA.

For sewage disposal works, for the Corporation. Mr. E. J. Elford, C.E., borough engineer and surveyor.

*Contract No. 7.—Construction of a sewage pump well, screening chambers, outfall conduit, and main sewer No. 6.*

| | | | |
|---|---|---|---|
| Firth & Co. | £48,819 | 0 | 0 |
| Nunn & Co. | 45,502 | 0 | 0 |
| Wood | 44,766 | 0 | 0 |
| Pearson & Sons | 43,054 | 0 | 0 |
| Paterson | 42,122 | 0 | 0 |
| Lawson & Son | 41,311 | 0 | 0 |
| Shellabear & Son | 41,088 | 0 | 0 |
| Mackay | 39,925 | 0 | 0 |
| Brebner & Co. | 39,524 | 0 | 0 |
| Iles | 39,100 | 0 | 0 |
| Mowlem & Sons | 36,367 | 0 | 0 |
| Lovatt | 38,348 | 0 | 0 |
| Pethick Bros. | 35,918 | 0 | 0 |
| Bentley & Son | 35,914 | 0 | 0 |
| Jackson | 35,208 | 0 | 0 |
| Wright & Co. | 34,957 | 0 | 0 |
| Higgins | 34,900 | 0 | 0 |
| Whyte & Co. | 34,229 | 0 | 0 |
| Cochrane & Co. | 34,081 | 0 | 0 |
| Southorn & Co. | 33,745 | 0 | 0 |
| Bell & Sons | 33,500 | 0 | 0 |
| Wickstead & Co. | 32,863 | 0 | 0 |
| Muirhead & Co. | 32,847 | 0 | 0 |
| Johnson & Langley | 31,437 | 0 | 0 |
| Moran & Son, Kensington (*accepted*) | 30,700 | 0 | 0 |

## TYLER'S GREEN.

For enlargement of the Council school. Mr. C. H. Riley, architect to the Bucks education committee, Aylesbury.

| | | | |
|---|---|---|---|
| Bowyer | £2,494 | 0 | 0 |
| Lane | 2,410 | 0 | 0 |
| Wheeler & Son | 2,382 | 0 | 0 |
| H. J. & A. Wright | 2,283 | 5 | 0 |
| Griffin & Son | 2,166 | 0 | 0 |
| Hunt & Son | 2,154 | 0 | 0 |
| Mead | 2,097 | 0 | 0 |
| Harris | 2,029 | 0 | 0 |
| Perfect | 1,990 | 12 | 7 |
| Darlington | 1,947 | 0 | 0 |
| Flint | 1,917 | 0 | 0 |
| Gibson & Son, High Wycombe (*accepted*) | 1,887 | 0 | 0 |

## WALES.

For the erection of a house and stable, fencing, &c., at the Park, for the Merthyr Town Council.

| | | | |
|---|---|---|---|
| J. Jenkins | £809 | 0 | 0 |
| Bond Bros. | 776 | 0 | 0 |
| Thomas | 762 | 17 | 0 |
| T. W. & J. Jenkins | 715 | 0 | 0 |
| Meredith, Penydarren (*accepted*) | 650 | 0 | 0 |
| Lloyd | 639 | 10 | 0 |

## WELLINGTON (SALOP).

For erection of public baths for the Wellington (Salop) Urban District Council. Contract No. 1, for erecting the baths; (2) heating and warming. Mr. Geo. Riley, surveyor.

*Contract No. 1.*

| | | | |
|---|---|---|---|
| Holmes, Wellington (*accepted*) | £1,909 | 2 | 3 |

*Contract No. 2.*

| | | | |
|---|---|---|---|
| Clay, Wellington (*accepted*) | 340 | 0 | 0 |

## WEST HAM.

For extension of West Silvertown schools and the erection of boys' new department. Mr. W. Jacques, architect to the committee, 2 Fen Court, Fenchurch Street.

| | | | |
|---|---|---|---|
| Webb | £12,859 | 0 | 0 |
| Lawrance & Sons | 12,353 | 0 | 0 |
| Lawrence & Son | 11,500 | 0 | 0 |
| Woollaston & Co. | 11,455 | 0 | 0 |
| Coxhead | 11,400 | 0 | 0 |
| Moss | 11,241 | 10 | 0 |
| Symes | 10,997 | 0 | 0 |
| Jerram | 10,876 | 0 | 0 |
| Maddison | 10,550 | 0 | 0 |
| Horswill, Forest Gate (*accepted*) | 10,097 | 0 | 0 |

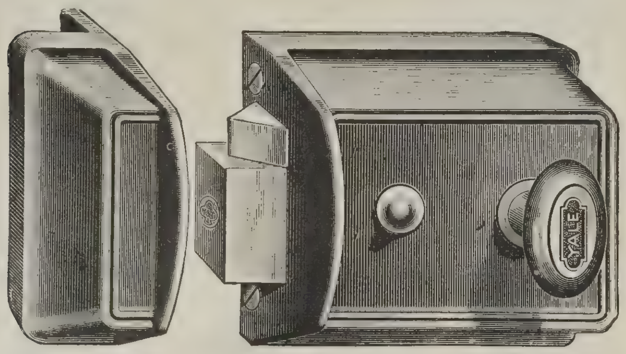
## YORK.

For alterations and new fittings at the York Savings Bank. Mr. E. Ridsdale Tate, architect, York.

| | | | |
|---|---|---|---|
| Rawling | £1,290 | 0 | 0 |
| Parker & Sharp | 1,270 | 6 | 0 |
| Colman & Sons | 1,171 | 16 | 5 |
| Bellerby | 1,074 | 14 | 0 |
| J. & T. Biscomb & Sons (*accepted*) | 977 | 10 | 0 |

## TRADE NOTE.

The Yale and Towne Company, 6 City Road, Finsbury Square, E.C., are placing on the market an important addition to their rim locks in the "Yale Ninety" Automatic Night Dead Lock, here illustrated. It is a well built rim construction with a heavy solid dead bolt that springs locked when desired, and can be unlocked from the outside by its key, and from inside by a knob. When the bolt is unlocked, either by the key or knob, the dead bolt and trigger are both withdrawn and held back. When the stop is pushed down the trigger is released and thrown out, the main bolt still being held retracted. When the door is closed the trigger impinges against the strike, releasing the main bolt and deadlocking it. If the holder of the key wants to go away, the person left on the premises only has to push the little button down. When the door closes the bolt springs firmly forward, solidly deadlocking the door. The iron case is 3½ by 3 by 1¼ inches. Three keys go with each lock. The lock is adapted for use on doors ⅞-inch to 2½ inches thick, and is reversible for doors of either hand, opening in or out. It can be furnished master-keyed if desired. In the Ninety-one Lock the button on the inside of the case is used merely to hold back the trigger bolt, as in a regular night latch.



Messrs. William Henman & Thomas Cooper, architects and surveyors, Birmingham, have dissolved partnership by mutual consent. The business will be continued by Mr. W. Henman under his own name.

Mr. C. S. Errington, A.R.I.B.A., architect, Newcastle-on-Tyne, is preparing the quantities for a hospital to be erected in the grounds of the Northern Counties Institution for the Deaf and Dumb, on the Moor Edge, Newcastle. The new hospital will be two storeys in height and contain four wards, with accommodation for sixteen beds.

The Secretary for Scotland has been in communication with the Treasury in regard to the addition of certain officers to the staff of the Local Government Board for Scotland, with the view more especially of securing an efficient administration of the Housing and Town Planning Act passed by Parliament at the end of last year. It is proposed to appoint an engineering inspector, who will specially concern himself with the town planning work, and will have as assistant another inspector with special architectural qualifications.

## VARIETIES.

The plant at the municipal gasworks in Doncaster is to be extended at once. A power stoking and generating plant will be installed at a cost of 2,500*l*.

The Rural District Council of Malmesbury have instructed Mr. T. J. Moss-Flower, C.E., of 28 Victoria Street, Westminster, S.W., and Carlton Chambers, Bristol, to prepare a scheme of water supply for the district of Hullavington.

The Belgian Consul at Alexandria reports that the municipal authorities of that town have decided to erect a large theatre. It appears that financial negotiations regarding the scheme are now proceeding. The cost of construction is estimated at not less than 60,000*l*.

Negotiations are proceeding for the purchase of a large site in one of the main streets of Maidstone for a new building, which will combine a theatre and picture palace, an ice skating rink, a roof garden and tea rooms, and which will be furnished with a hydraulic lift for passengers.

The Earl of Ellesmere has given permission to the Eccles Corporation to remove the portion of an old stone cross built into the wall of an outbuilding behind Moat Grange Farm, Peel Green, Barton. It is proposed to place it on the vacant land adjoining the Carnegie Library in Church Street, Eccles.

The Society for the Protection of Ancient Buildings have addressed a letter to the Archbishop on the subject of St. Helen's Church, York, hoping that it may not be allowed to become a ruin or be pulled down, and pointing out that it would be less of a desecration to find some secular use for the building than to destroy it.

The opening ceremony of the Spurgeon Memorial Church, Thornton Heath, took place on February 22. The building is of Late Gothic design, with red brick facings and Bath stone dressings. The contractors are Messrs. Battley, Sons & Holness, 21 Old Kent Road, S.E., and the amount of contract 3,215*l*. The architects are Messrs. George Baines & Son, 5 Clement's Inn, Strand, London.

The Durham County education committee recently wrote to the Stanley District education committee stating that in twenty-one departments in the area the number of children on the books was equal to, or exceeded, the accommodation. The Council recommended that the following works be carried out, at an estimated cost of 37,335*l*.:—New school for 400 boys at Collierley, 5,725*l*.; remodelling of present schools at Collierley for 400 girls and 400 infants, and provision of cookery room, 2,000*l*.; new school for 900 scholars at Catchgate, 11,750*l*.; new school for 600 scholars at Annfield Plain, 8,540*l*.; new infants' school for 220 at Oxhill, 1,500*l*.; new school for 400 girls at West Stanley (exclusive of site), 5,000*l*. The district committee has decided that the suggestions in regard to Collierley schools be carried out; that new schools be erected at New Kyo; and that sites for new schools should be purchased at Catchgate and Shield Row. The other proposals were left over.

The Troon Dean of Guild Court on Monday approved plans for a Roman Catholic church to be erected in St. Meddans Street, Troon, N.B. The church, which is in the Scotch Gothic style—grey stone being used—of the fifteenth century, is designed to seat about 500, and consists of a nave 26 feet wide, with aisles. The slate roof is of open timber work. At the north end is a tower 35 feet square on plan and rising to a height of about 52 feet. On the south is the chancel flanked by two transepts and terminating in a five-sided apse. The total length of the church is about 120 feet, and the width 45 feet. A presbytery and sacristies are also to be built on the site.

The Devon and Exeter Architectural Society held their annual meeting recently. The following members constitute the officers and council for the ensuing year, viz., Mr. W. H. May, M.S.A., president (Plymouth); Mr. Charles Cole, M.S.A., vice-president (Exeter); Messrs. M. A. Bazeley (Plymouth), J. Crocker, F.R.I.B.A., John M. Pinn, T. A. Andrews, J. A. Lucas, A.R.I.B.A., O. Ralling (Exeter), C. Cheverton, M.S.A. (Devonport), J. S. Southcombe (Barnstaple), Mr. S. Dobell, hon. treasurer (Exeter), and Mr. Allan Pinn, A.R.I.B.A., hon. secretary (Exeter).

The timber industry of Queensland is advancing, though the export trade is at present only small. Last year there were 175 saw mills working, in connection with which there was invested capital to the amount of 360,181*l*., and 2,960 hands were employed. Soft woods were cut to the quantity of 64,696,990 feet, cedar 1,125,866 feet, and hardwood 34,936,160 feet, the total value reaching 665,750*l*. These figures, in comparison with those of the previous year, showed an increase of twenty saw mills, of wood cuts 9,006,900 feet, and the value 87,513*l*. The revenue from royalties and licenses also proportionately increased. At various exhibitions the variety, beauty and usefulness of the Queensland woods have been acknowledged, and now that more attention is being given to the industry by the Lands Department a big export trade is only a question of time.

A well-attended meeting of members of the Bristol Society of Architects was held at the Fine Arts Academy last week. The chair was occupied by Mr. Mowbray A. Green, F.R.I.B.A., President of the Society. A paper was read by Mr. John Markham, A.R.I.B.A., on "The Architectural Treatment of Reinforced Concrete." The lecture was mostly devoted to the question of the main structural lines and forms which this comparatively new building material may be likely to assume. Among other points dealt with were the nature and properties of the materials used, viz. concrete and metal; the result and value of a scientific combination of these components; question of corrosion of the reinforcements; methods of securing adhesion between the metal and the concrete; fire resisting qualities; "internal" design of beams, columns and walls; absolute lack of precedent in design; decorative treatment and finish and future scope for this method of building. A large number of diagrams and lantern views in illustration of the subject was shown.

A number of local men have purchased the ancient buildings in Hexham known as the Moot hall and the Abbey Gate, and their sites. The buildings were conveyed to the trustees in the following terms:—"Upon trust at all times hereafter to maintain and preserve as historical monuments and protect from decay or injury the ancient buildings hereby conveyed without any alteration of the original architectural features or character thereof, and permit the said building known as the Moot Hall to be used only as a museum or library or other public institution, or for some other purpose consistent with and conducive to the maintenance and preservation thereof as an historical monument, and for protection thereof from decay or injury." They have also purchased the property in the Market Place, which has been built against and in front of the Moot Hall with a view to its removal at some future date, so that the Moot Hall may be seen in its true proportions. An appeal is to be made for financial aid

The President of the Board of Education has appointed a Departmental Committee to inquire and report whether the cost of buildings for public elementary schools can properly, and with due regard to their suitability and durability be reduced by the use of materials or methods of construction, different from those ordinarily employed at present, and if so, what steps should be taken to facilitate the adoption of such materials or methods, and whether any alteration in law is required for the purpose. Mr. Runciman has been greatly impressed with the great cost of erecting school buildings in accordance with modern standards of suitability and convenience. He desires to offer every encouragement to local education authorities and other bodies and persons to submit proposals calculated to reduce the inevitable expenditure on these objects. Plans of modern schools are determined by educational and hygienic conditions and do not admit of modifications which would greatly reduce the cost, nor can much be done by eliminating unnecessary and extravagant features. It appears to the President possible that by the adoption of new methods of construction and new materials substantial reduction might be effected, at all events, in some localities. The committee is composed of Mr. L. A. Selby Bigge, Principal Secretary Elementary Branch Board of Education, chairman; Mr. N. T. Kershaw, Assistant Secretary Local Government Board; Mr. F. Clay, Architect of the Board of Education, with Mr. J. G. Milne, senior examiner of the Board, secretary. The committee will sit and receive evidence immediately, with a view to reporting as soon as possible.

The Board of Education have been in communication with the Hull Education Committee on the subject of altering the plans by Messrs. Crouch, Butler & Savage, of Birmingham, for the proposed Training College, which were recently selected in a competition under the assessorship of Mr. J. W. Simpson, F.R.I.B.A. In a letter the Board state that the most important departure from established usage consists in providing a common refectory, kitchen, and quarters for servants of both hostels in a separate block of buildings. This arrangement, though *primâ facie* economical, appears to them to be exposed to some grave objections. The use of a single dining-room for all meals by students of both sexes will, certainly, necessitate an undesirable strictness of supervision; the organisation of the domestic staff presents difficulties, the only possible expedient appearing to the Board to be the appointment of a lady superintendent to supervise the whole of the domestic staff, who would require good pay and accommodation; and, thirdly, the distance of the kitchen and servants' quarters from the hostel will be found productive of constant inconvenience. Although the plans might be amended, the Board feel grave doubt as to sanctioning a plan and organisation which are, to say the least, quite untried. Messrs. Crouch, Butler & Savage, of Birmingham, were communicated with, and in their letter they state that should the committee decide to adopt the Board's suggestion they would advise a rearrangement. They point out, however, that the "collegiate" atmosphere desired by the Board, added to the alterations definitely suggested, is likely to entail additional expenditure. But the Board find 75 per cent. of the cost, and it is for the committee to consider whether it is advisable to adopt the Board's suggestions. The Education Committee recommended that the architects be instructed to proceed at once to get out rough sketch plans to conform to the requirements of the Board of Education, and submit them to the sub-committee at as early a date as possible.

A demonstration of the Kearney High-speed Railway took place at the Crystal Palace on Wednesday, the 2nd inst., when Mr. E. W. Chalmers Kearney explained to a party of visitors the advantages of his single-tube system, which it is suggested should be adopted on the proposed Strand and Crystal Palace Railway, and elsewhere. A model railway 200 feet in length has been constructed in the south-western gallery at the Crystal Palace, and this was shown in operation with model cars on a scale of ¾ inch to the foot, with automatic switches and signals complete. The method of working trains in both directions through one tube was shown, together with the arrangement for combining the convenience of a station where lifts are not required, with the advantages of an underground method of transit, which is attracting considerable attention.

Shakespearean discoveries of exceptional importance are made public in the March number of *Harper's Magazine.* The new facts are derived from over a score of hitherto unknown documents which have been found after long and systematic research in this country by Professor Charles William Wallace.

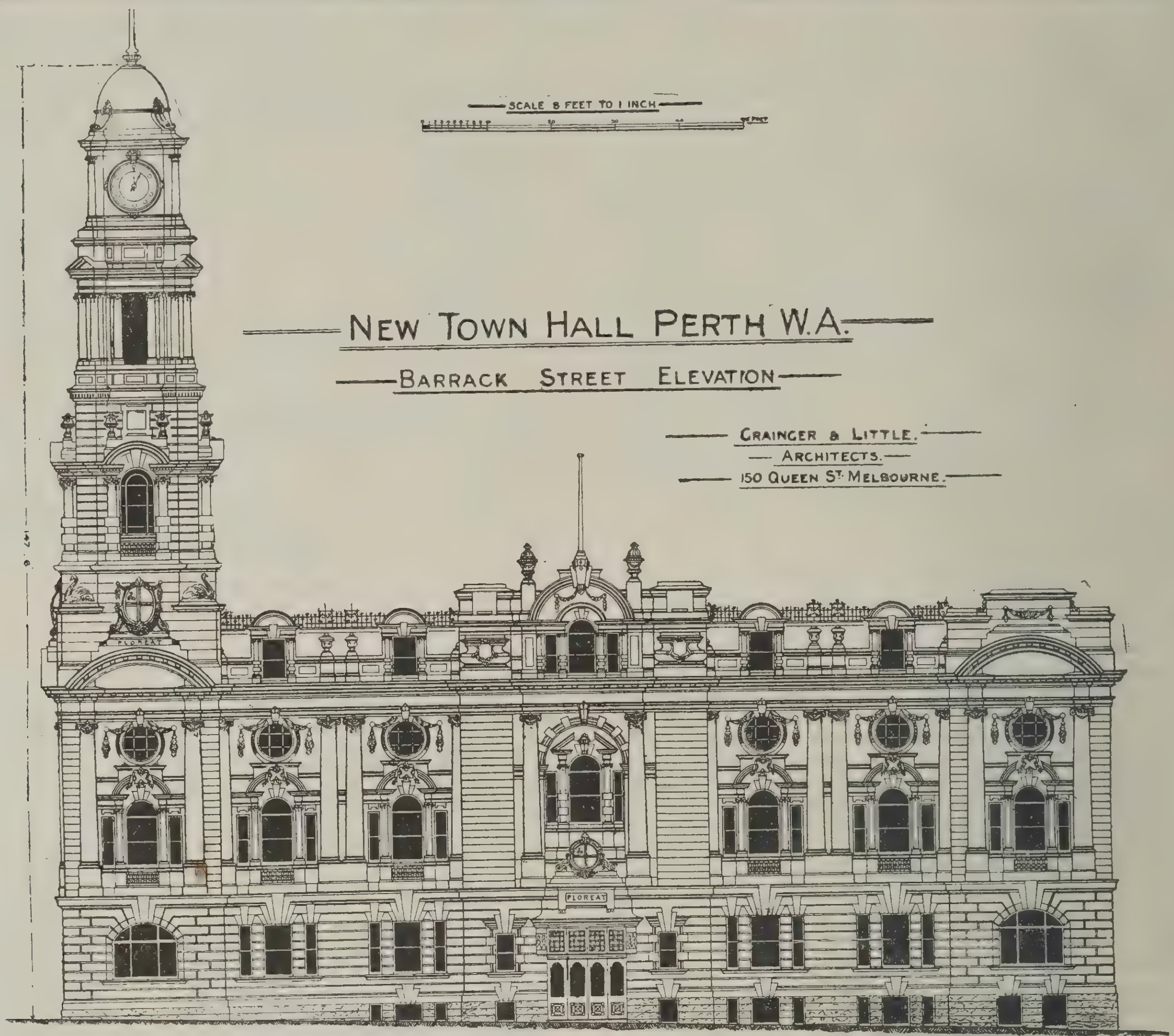
## COMPETITION.

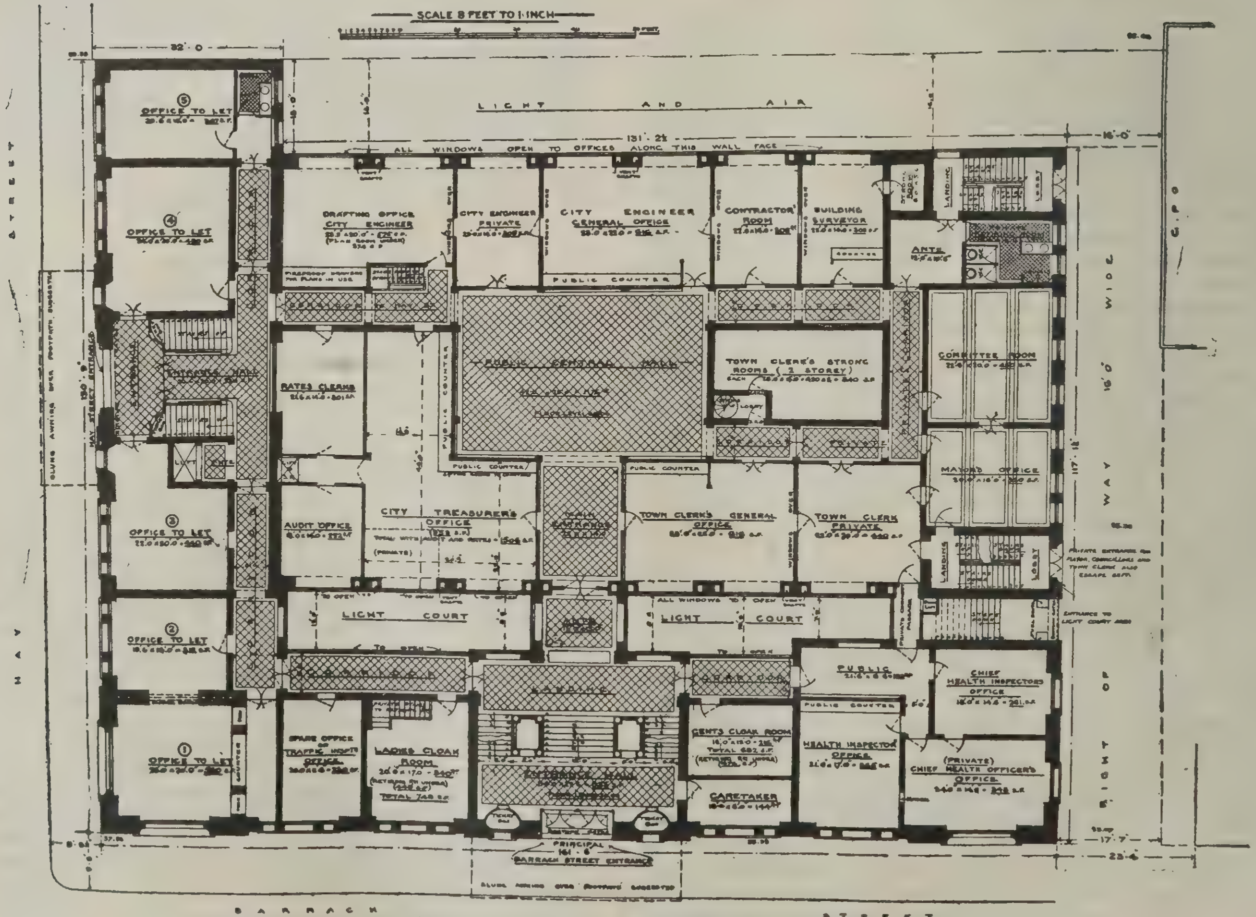
Belfast.—The Senate of the Queen's University at Belfast decided on Saturday to organise a competition open to architects in the United Kingdom for the following new buildings:—(*a*) A new science block for the accommodation of the departments of physics, botany, zoology, and geology, 22,500*l.*; (*b*) an extension of the existing medical buildings, 8,500*l.*; (*c*) an extension of Students' Union buildings, 3,000*l.* Sir Aston Webb, R.A., F.R.I.B.A., will act as assessor. The author of the design placed first will be appointed architect, and premiums of 150*l.* and 100*l.* will be awarded to the second and third designs.

## NEW CATALOGUES.

Expanded metal, as manufactured by the Expanded Metal Co., Ltd., York Street, S.W., has been in general use since about 1890; consequently it is not surprising to find that the company have brought out six editions of their pamphlet No. 1. This is entitled "Expanded Metal Lathings for Plaster Work," and it deals with the widely differing applications of the material in an instructive fashion. The range is extensive, both geographically and structurally. The first illustration is a photograph taken after the San Francisco fire and earthquake of 1906, showing the "Kohl" building standing, apparently uninjured, amidst a sea of ruins, while the last page gives detail drawings of light-framed office bungalows at Port Talbot Docks. The behaviour of expanded metal in the San Francisco disaster led Capt. J. S. Sewell, in a report to the U.S.A. Government, to recommend its use as a protective covering for metal. Amongst the numerous large buildings in which it has been employed in this country are the new Public Offices, Westminster; College of Science, South Kensington; Royal Naval College, Dartmouth; Hearts of Oak Buildings, London; Armstrong College, Newcastle-on-Tyne; North British Hotel, Edinburgh. This pamphlet, however, is much more than a series of views of buildings where the material has been introduced for plaster work; it goes into the many uses of expanded metal and gives full and lucid explanations aided by detail drawings.

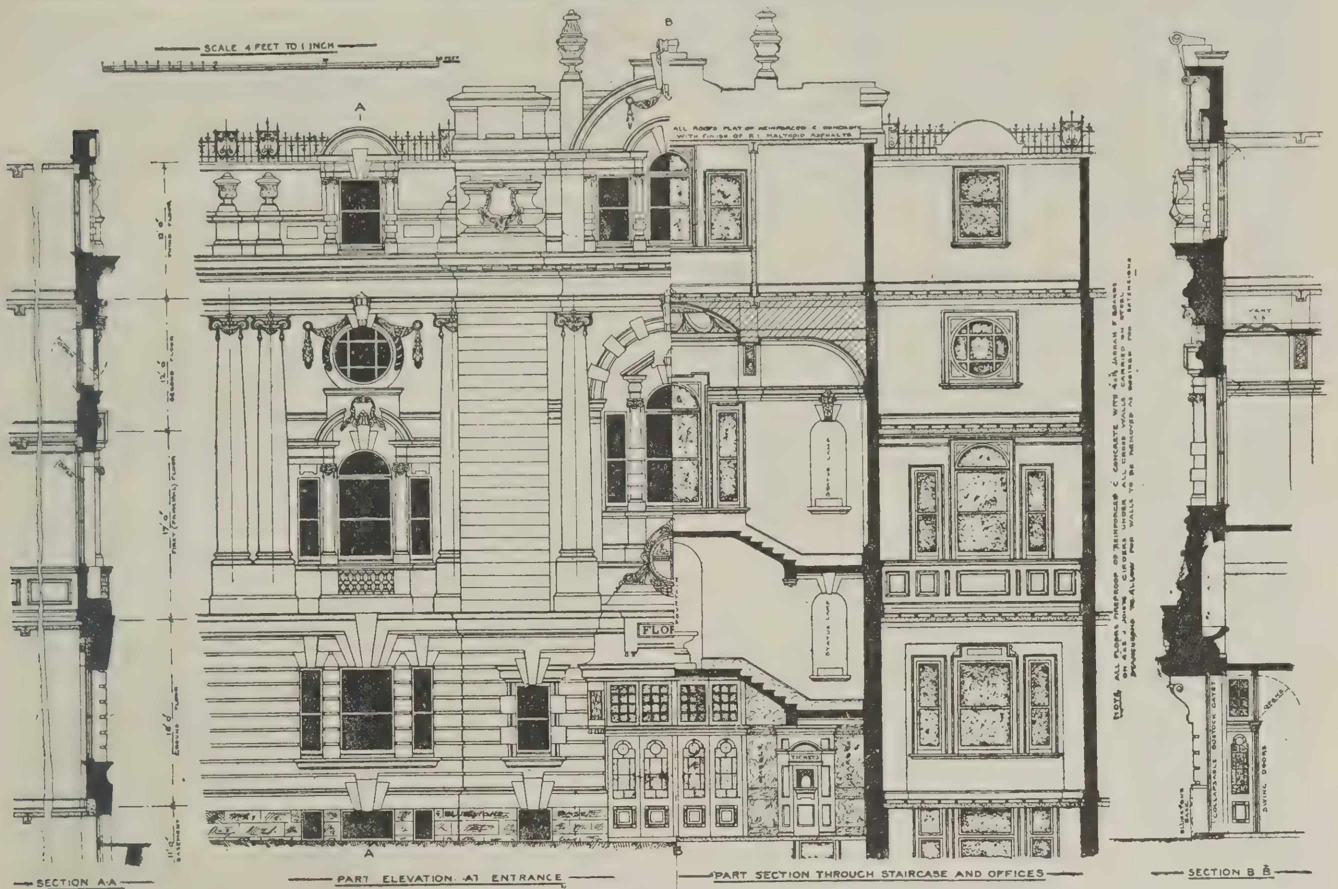
(*Continued on page* 18.)



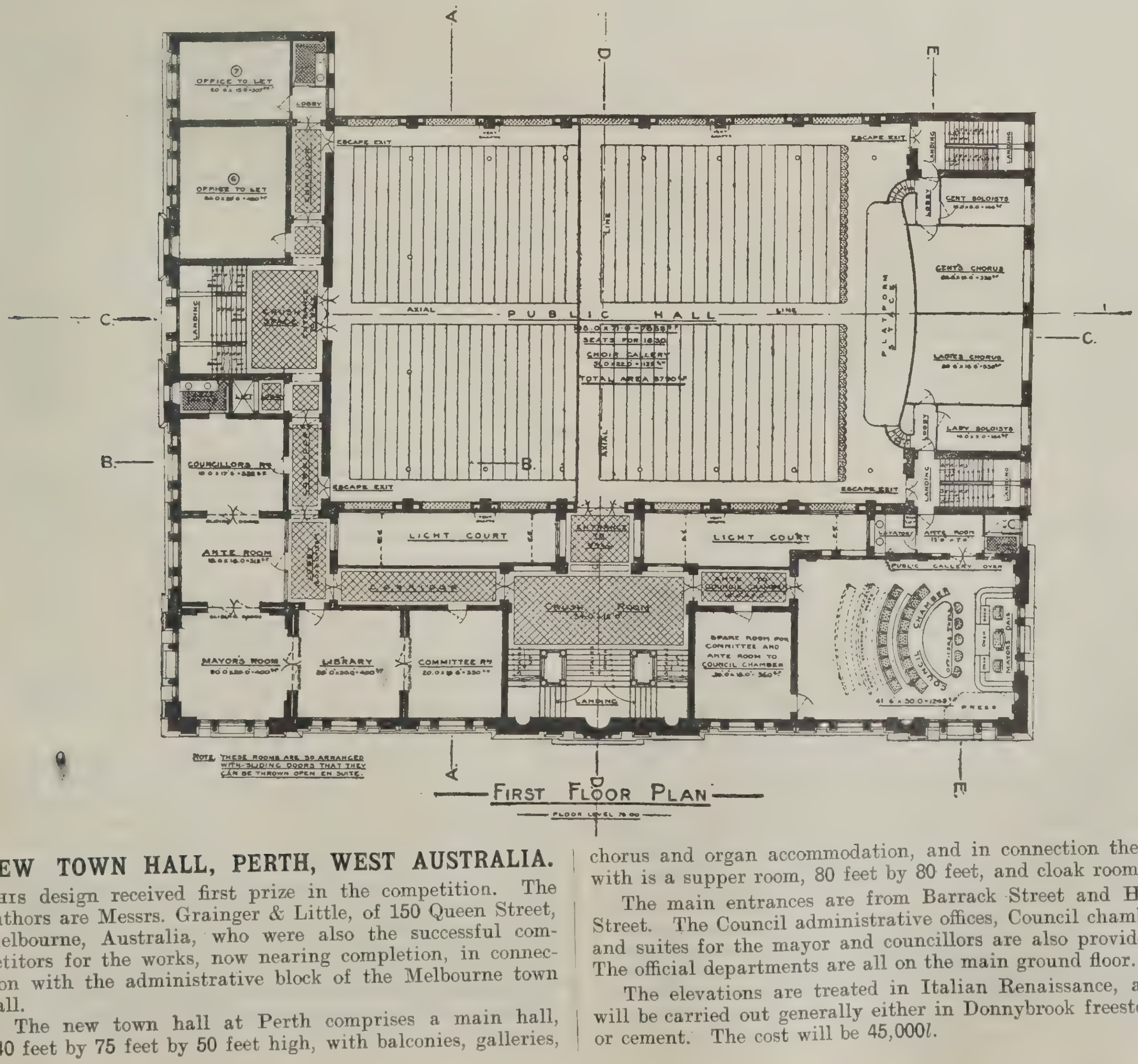


GROUND FLOOR PLAN

FLOOR LEVEL 50.00


SCALE 4 FEET TO 1 INCH
A
B
ALL ROOFS FLAT OF REINFORCED C CONCRETE WITH FINISH OF R.I. MALTHOID ASPHALTE
SECTION A-A
PART ELEVATION AT ENTRANCE
PART SECTION THROUGH STAIRCASE AND OFFICES
SECTION B B
STATUE LAMP
TICKETS
SWING DOORS

DETAIL TO BARRACK STREET



FIRST FLOOR PLAN

FLOOR LEVEL 76.00

## NEW TOWN HALL, PERTH, WEST AUSTRALIA.

THIS design received first prize in the competition. The authors are Messrs. Grainger & Little, of 150 Queen Street, Melbourne, Australia, who were also the successful competitors for the works, now nearing completion, in connection with the administrative block of the Melbourne town hall.

The new town hall at Perth comprises a main hall, 140 feet by 75 feet by 50 feet high, with balconies, galleries, chorus and organ accommodation, and in connection therewith is a supper room, 80 feet by 80 feet, and cloak rooms.

The main entrances are from Barrack Street and Hay Street. The Council administrative offices, Council chamber and suites for the mayor and councillors are also provided. The official departments are all on the main ground floor.

The elevations are treated in Italian Renaissance, and will be carried out generally either in Donnybrook freestone or cement. The cost will be 45,000*l*.

MESSRS. JOHN DICKINSON & CO. (BOLTON), LTD., have prepared a short pamphlet under the title of "Notes and Comments concerning Natural Rock Asphalte." The firm have for many years made a speciality of contracts in Limmer, Seyssel and other leading brands, and are in a position to speak with authority. The subject is treated in a more or less general manner, and is illustrated by about half a dozen photographs of buildings where the concrete and rock asphalte work has been executed by the firm. Messrs. J. Dickinson are willing to send copies of the booklet on application.

THE revised catalogue of Messrs. G. Woolliscroft & Son, Ltd., contains thirty sheets showing in colour a large number of new designs for tiling, mosaic, and other work. A paragraph in the introduction emphasises the desirability of having the fixing carried out by Messrs. Woolliscroft's own experienced men, as "nothing but disaster results from engaging incompetent workmen." The advice is excellent, for it is a common experience to find tiling badly fixed. The designs selected are for many different tastes and purposes, and whereas some show a delightful restraint, others have florid patterns. It is always open to an architect to order his own designs. Accompanying the catalogue is a price list pamphlet for 1910.

MESSRS. RICHARD JOHNSON, CLAPHAM & MORRIS, LTD., have issued a new catalogue of their reinforced or monolithic brickwork (Brown's Patents, 1906). In our issue of January 28 we gave an account of some tests carried out on a plain and a reinforced brick pier at the Municipal Technical School in Manchester, which afforded a striking testimony to the additional strength obtained by using their patent steel wire mesh as a reinforcement. The catalogue includes this and other tests, which all afforded most satisfactory results, as well as examples of net cost, suggestions as to the use of the mesh, photographs and diagrams.

THE catalogue for 1910 issued by Messrs. Winsor & Newton, Ltd., carries with it an impression of dignity and permanence that well becomes a firm who for the past seventy years have been building up a reputation that is second to none. When in 1832 Messrs. Winsor & Newton first sought appreciation and patronage as artists' colourmen (or rather as actual manufacturers of their own colours), the colours at the disposal of a painter were fewer and much poorer than they are to-day. A revolution was gradually brought about by their application of chemistry, where before rule-of-thumb sufficed; and in 1844 the firm established their still existing North London Colour Works in Kentish Town. The first public honour came in 1851, when they received the only medal awarded for artists' colours at the Great Exhibition. Since then many other distinctions have come to them; but none are of equal value to the continuous approval their products have won from a succession of users. To their business of royal artists' colourmen has been added that of drawing paper stationers, artists' brushmakers and fine art publishers. The catalogue gives illustrations and prices of mathematical instruments, easels, inks, mounting and other boards, together with many other etceteras that make up the necessities and luxuries of an artist's life. This latest list runs to over 350 pages, and is both well bound and well printed.

## TESTING OF PORTLAND CEMENT.*

IN regard to the testing of Portland cement I think I am right in saying that of all the materials of construction subject to a system of testing, Portland cement is probably the most dependent on the judgment and skill of the tester, and with all the well-equipped laboratories and apparatus it is still impossible to remove the most important factor of personal equation. In order to obtain the knowledge usually sought for as to the qualities of cements to be used, it is first necessary that the samples which are taken for investigation should represent the whole quantity of the bulk. Therefore as soon as the cement has been bulked, either at the manufacturers' works or on the works in connection with which the material is to be used, samples are generally taken from each parcel of cement, and are so distributed as to give as far as possible a fair average sample of the whole parcel. When all these samples are mixed together the sample for testing can be taken therefrom, and the material is generally tested in accordance with the terms of the British Standard Specification. Now the requirements of this specification arrange that the cement shall be tested:—(1) For fineness of grinding; (2) for specific gravity; (3) for chemical composition; (4) for neat tensile tests; (5) for sand tests; (6) for setting time; and (7) for soundness.

Personally I would revise the order in which these tests stand in examining a parcel of cement, and I think that it would be preferable to take each test as it would naturally occur in practice, namely:—

The first inquiry the cement user makes as to the quality of the material under notice takes the form of a test for fineness; thus in passing through the manufacturer's stores, or when the first bag is opened on the contractor's works, the cement is mechanically and half-unconsciously passed through the fingers in order to ascertain the fineness. The coarse particles in a cement can thus be readily perceived, and the practised tester is in this way able to gauge approximately the residue present in the sample.

For the past three or four years there has been a growing desire on the part of engineers for a much finer cement, and it may be said that the principle of fine grinding is now in the ascendency—an improvement in the manufacture greatly in favour of the consumer both as regards economy in use and reliability in result. Too much attention cannot be paid to fineness of grinding, for the finer the cement the more intimately can it be incorporated with the aggregate used for the concrete, and therefore the stronger will be the work.

The test for fineness, therefore, derives importance from the fact that, other qualities being equal, fine cement has a much greater sand or aggregate carrying capacity than coarse cement has; that is, it will show an increased strength with the same charge of sand, or equal strength with a greater charge.

Now, Portland cement as delivered by the manufacturer consists of a mixture of coarse and fine particles, respectively known as "residue" and "flour." The residue is the coarsely-ground clinker left on the fine sieves which are used for testing, and the value of the flour in a cement is that the very fine particles are believed to contain principally, if not wholly, the cementitious property of the material. Residue is practically inert, or even possibly so much adulteration, and it is found to be a cement that is generally the hardest and the best burned materials that have not been reduced in the process of grinding, and therefore only sufficiently fine for the water added in use to attack the surface of the particles, the interior of which remains inactive. If this residue were reduced to flour, it would be found to be a good quality cement showing high tensile strength. Therefore a sample of cement as delivered to the consumer, if divided into residue and flour, will show that on a sieve having 180 by 180 meshes per square inch, the residue will be about 18 per cent. and the fine grit and flour about 82 per cent.

In extracting the flour from the material which passes through the sieve by means of light air-pressure, we see that the average cement contains from 50 to 60 per cent. of flour, the balance being a very fine grit that has passed through the meshes of the sieve.

Portland cement, therefore, when delivered on to the work is first tested for fineness of grinding, and only a few years ago the usual fineness called for in cement was about 10 per cent. residue on a 50 by 50 mesh sieve—*i.e.*, a sieve having 2,500 holes to the square inch; but to-day the fineness is more likely to be as follows:—

| | | |
|---|---|---|
| No residue ... ... | 50 by 50 | mesh sieve. |
| Trace sieve ... ... | 76 by 76 | ,, ,, |
| 5 per cent. sieve ... | 100 by 100 | ,, ,, |
| 14 per cent. sieve ... | 180 by 180 | ,, ,, |

In carrying out the test it is generally arranged that 100 grams of cement, approximately about 4 ozs., shall be continually sifted for a period of fifteen minutes, and the results should be as I now here describe.

A cement that passes this test can be considered a thoroughly first-class quality product in every respect, provided, of course, the further tests of the cement are satisfactory. The next test that would be carried out in gauging the quality of cement is probably that of the setting times. When Portland cement is mixed with water a plastic paste is formed which ultimately hardens into a stonelike substance, and according to the activity shown in this transition from a paste to a thoroughly hard mass, so is the material found to be of a quick or slow-setting nature.

It is of importance that the cement user should be aware of the setting properties of the cement to be employed in constructional work, for unexpected results are apt to ensue from the omission of this test. It often happens that when a quick-setting material is inadvertently delivered on to the contractor's works, and is brought into use, the setting has commenced even before the wet mixing of the aggregate and cement is completed, with the result that this setting action, being unnoticed, is interfered with, and the material will not again set for some days, or at least until the moisture has thoroughly dried out of the mixture, and even then its cohesive value is often so greatly reduced as to render the cement practically valueless. This is a common occurrence in the use of cement, and may easily be avoided by a systematic testing of activity. Care, then, should first be taken to ascertain the setting time of the cement, and, next, that no greater bulk of mortar is mixed than can be used before the setting commences.

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* Part of a paper by Mr. A. C. Davis, F.C.S., A.Inst.C.E. (Managing Director of the Saxon Portland Cement Company, Cambridge), entitled the "Manufacture, Testing, and Uses of Portland Cement," read last week before the L.C.C. School of Building, at Brixton.

Under no circumstances must a cement which has once been allowed to set be re-tempered or re-mixed for use, since from what has been said it will be seen that the material is thereby rendered worthless.

Cement manufacturers have it in their power to make either a quick or slow-setting cement, and, unless otherwise instructed, supply the latter, which takes thirty minutes and upwards to harden the surface of the test pat. A quick-setting cement commences to harden in a few minutes, and although perhaps equally strong in its tensile resistance and constructional value, yet a cement of this nature must be used with care. It is employed under water, in plaster work, and when working in cold weather. In all other cases it is most advantageous to use a slow-setting cement.

This is indeed indispensable when dealing with careless workmen not under supervision, who always prepare their mortar many hours ahead, and even sometimes drown it with excessive quantities of water.

Now the two setting-time tests at present in use are one for the commencement of the setting, called the initial set, and the other for the end, or final set, the time when a weighed needle makes no impression on the test pat.

The initial set of a cement is generally gauged from a small pat made with a minimum amount of water. The commencement of set is seen to occur when crystallisation of the cement starts by the drying of the pat and its assuming a certain amount of solidity.

The pat can be prepared by taking 100 grams of cement and in well mixing the same on a non-porous slab with 25 per cent. of water of a temperature of 58° to 64° F. The time employed in mixing this cement should not exceed forty seconds, and then the plastic mixture should be placed upon a glass or iron plate and shaken down to a thickness of ½ inch in the centre and a diameter of 4 inches.

The pat is then placed aside to allow the cement to set, and the initial setting time is plainly shown by a certain drying and a slight resistance to the point of a pencil.

The final set similarly has taken place when the cement will not take an impression by the weight of the standard needle. The final setting time of the cement, according to the British Standard Specification, shall not be less than two hours nor more than seven hours for slow-setting cement.

Then probably the next test carried out in the examination of cement will be the test for soundness, which includes testing for contraction and expansion.

The soundness tests are those which connect themselves definitely with some serious defect to which cements are subject, and this is of paramount importance. This test can be made with the most simple apparatus—if, indeed, any apparatus is required—is easy of manipulation, and its results are obtained immediately.

Numberless methods are in vogue for ascertaining the soundness of cements, and the inquiries more generally classified under this heading are those which have reference to constancy of volume, and to this end the accelerated or boiling tests are employed in order to ascertain the exemption of cement from undue expansion or contraction.

The accelerated tests most generally used are those of putting the pat or block of cement in steam and in hot and boiling water and examining the results after some hours. If the cement is sound the boiled pats will be quite perfect in shape, but if unsound the cement will crack and sometimes boil away to mud.

As to these tests for expansion it cannot be stated with any degree of certainty that results which may be obtained by the hot test are identical with those which may be experienced in actual construction work, but there is no doubt that if the cement is in the slightest degree unsound the hot test will at once detect and emphasise the weakness.

The expansion of cements under the accelerated test is generally caused by what is known as "free" or uncombined lime, and this is introduced into the product either by careless or unscientific mixing, or burning of the raw materials used in the manufacture, or by the incorporation of under-burnt clinker from the kilns.

If a cement is poorly manufactured, the aeration or atmospheric slaking, which is generally carried out upon construction works to-day, will eliminate to some extent what free lime may be present; but a properly manufactured cement will withstand the hot or boiling tests as soon as the material is taken from the grinding mills.

In the early days of cement manufacture most of the trouble of cement users was due to the expansion of the material through over-liming and other faults in the manufacture. This caused a swelling and ultimate disintegration after the work was in place.

To-day, however, cements which stand the accelerated tests by steam or boiling water should be used in preference to others, and moreover such tests should be constantly applied on the work of concrete construction, for although the hot tests sometimes reject suitable material, they will always reject material unsound by reason of the existence of active expansive elements.

To carry out a rough-and-ready soundness test, therefore, it is only necessary to take the pat of cement which has been used for the setting-time test and immerse the same in a saucepan of cold water. The water should then be brought slowly to a point of boiling, and the pat of cement kept under water for five or six hours. Under this test no warping or cracking at the edges should take place, and if the pat is perfectly sound after being under observation for the period mentioned it may be taken that the cement may be used in concrete work with every advantage.

This accelerated test is more efficient than another old-time device for the test of over-liming or expansive cements. This other arrangement was to mix a sample of the material with water to about the consistency of treacle, the whole being then poured into an ordinary bottle or small glass test-tube, which is shaken until full to overflowing and then placed aside in a cool place. If the cement is over-limed, or even if the proper grinding and amalgamation of the raw materials have not been properly carried out by the manufacturer, the cement will expand and split the glass sooner or later, according to the degree of the imperfection. If, on the other hand, the cement is under-limed (or over-clayed), it will contract and become loose in the receptacle.

In these bottle tests, however, care should be taken to keep the bottles or tubes in a cool place, or in an even temperature, for if placed in a warm atmosphere or near a fire, cracking will result through the different rates of expansion with glass and cement, even if the cement be perfectly sound. This cracking will occur on account of the normal expansive and contractive tendencies of cement caused by heat and cold.

I could enumerate many other tests for showing the soundness of cements, but since my time is short I will now only refer to the test of expansion in Portland cements as outlined by the British Standard Specification.

This is called the "Le Chatelier" test, and it consists of filling a small split cylinder of spring brass with cement, thus forming a mould 30 mm. internal diameter and 30 mm. high. On either side of the split in the metal mould are attached two indicators with pointed ends, and the distance from these ends to the centre of the cylinder is 165 mm.

In conducting this test for showing the soundness of cement, the mould is first put upon a small piece of glass and filled with cement gauged in the usual way, care being taken to keep the edges of the mould gently together while this operation is being performed. The mould is then covered with another glass plate, a small weight is to be immediately placed on this, and the mould is then to be placed in water at a temperature of 58° to 64° Fahr. and left there for twenty-four hours.

The distance separating the indicator points is then to be measured, and the mould placed in cold water, which is to be brought to boiling point in about thirty minutes, and kept boiling for six hours. After cooling, the distance between the points is again to be measured ; the difference between the two measurements representing the expansion of the cement, which must not exceed the limits laid down by the British Standard Specification.

These limits in the specification are that the cement when tested by the Le Chatelier method shall not in any case have a greater expansion than 10 mm. after twenty-four hours' aeration, and 5 mm. after 7 days' aeration.

Since, therefore, the manufacturer must keep in stock a considerable quantity of cement so as to supply his customers with a perfectly cool product fit for use, when received on the works, the cement should test not more than 5 mm. expansion.

Now included in the soundness test there is also a test for contraction. Contraction cracks in the test pat are often met with, but are rarely a sign of bad quality. They are perhaps more generally found to be due to faulty testing rather than to a deterrent quality in the nature of the cement. However, there is a test in existence which clearly shows the contraction of cements, and although this is not a test adopted by the British Standard Specification, it is a useful test to carry out.

The apparatus used in this method of testing the contraction of cements is a tapered mould of 3⅝ inches diameter, inside measurement, and 1½ inches high. This mould is filled with neat cement of a plastic consistency, and is left to dry off and set hard. If there is any contraction the cement block will be loose and will leave the mould, and if not the block will remain tight in the mould.

This description completes our tests for the soundness of the cement under investigation.

*Tensile Strength.*—Then the next test of importance is that of ascertaining the neat tensile strength of the cement and the sand tensile strength of the same period.

Strictly speaking it is not necessary to have both neat and sand tests in testing the strength of Portland cements, and preferably, the sand test alone should be used.

In the future only mortar mixtures in the proportions of one cement to three sand will be tolerated, and, moreover, I consider that these tests will not be reckoned entirely decisive, but compression tests on at least 3-inch cubes in the case of sand materials, and 6-inch cubes in the case of concrete, will be demanded for all purposes for which clear insight is desirable in the working of the material in actual construction. With the now increased demand for a finely ground cement, therefore, it is to be expected and, in fact, should be urged, that in place of neat tests an admixture of sand should be employed in estimating the value of the cement. In the neat tensile test the full value of the cement as a concreting material or as a cementing power never comes into play, and, granted that a finer cement is a more valuable product, a coarse sample will, in a neat test, give results as to tensile strength equal to those obtained by a fine cement. But, on the other hand, the difference between the constructive values of a coarse and a fine cement will be most noticeable in a test for tensile strength, carried out with a mixture of sand and cement in the proportion of three to one.

The value of sand in the place of neat tensile tests is more appreciated day by day, and this hardly requires an explanation since cement is rarely, if ever, used in a neat state, except by customers who have a wrong impression of its qualities. In a sand test we obtain information of a more practical value, and, therefore, on the former count the test of neat briquettes is deprecated.

Now in the British Standard Specification both sand tests and neat tests are called for. Testing briquettes are prepared by gauging the cement with a proper quantity of water into a smooth easy working paste. Then the cement gauged in this way is filled into moulds or frames as shown here. When this cement has set sufficiently to enable the mould to be moved without injury to the briquette, and which generally occurs after some twenty-four hours, the briquette is taken from the mould and put into a tank of water for a period of seven and twenty-eight days, &c. Generally a number of briquettes are made up in this way because it will be found that the test results of the briquettes are extremely variable, according to the method of preparation, and therefore the average of say six briquettes is taken to show the mean strength of the cement under test.

The briquettes are now tested in a tensile testing machine such as we have here. For breaking the briquette it is held in strong metal jaws in the machine, and the load is steadily and uniformly applied, starting from zero and increasing at the rate of 100 lbs. in twelve seconds in the case of neat cement briquettes. The cement which passes the British Standard Specification must show an average strength in seven days of 400 lbs. per square inch; in twenty-eight days of 500 lbs. per square inch; and in the case of sand tests the cement and sand briquettes shall bear tensile stresses of 150 lbs. after seven days from gauging, and 250 lbs. after twenty-eight days from gauging.

In making up a sand briquette, it is prepared from one part of cement to three parts by weight of dried standard sand, which is obtained from Leighton Buzzard. This sand must be thoroughly washed, dried, and passed through a sieve of 20 by 20 meshes to the square inch, and must be retained on a sieve of 30 by 30 meshes per square inch.

In all tests of neat and sand briquettes it should be borne in mind that the briquettes must be immersed in water until ready for test. This arrangement is made because it is considered that the test has more severity with the cement being in water than is the case if the briquettes were left to dry in the air.

Much care must always be exercised in preparing briquettes for the tensile strength tests, for it is quite an easy matter to show very poor results with a good cement if the tester is a novice in the preparing of briquettes. However, plenty of experience is gained by practice in this work, and I will not dwell upon this test any further.

The remaining tests outlined in the British Standard Specification are those for specific gravity and chemical composition. These two tests are generally referred to consulting chemists when required by the consumer, but they are rarely carried out.

The specific gravity test some years ago replaced the old-time test of weight per bushel, which has been rendered useless and made obsolete by the present fine grinding of cement. So long as all cements were coarsely ground and about the same degree of fineness, the requirement that the cement should weigh a specified number of pounds per striked bushel was found fairly satisfactory when made workable by uniform methods in carrying out the test. When a heavy cement was required by the consumer, a heavy weight was stipulated with the weight per bushel test, but as the demand for a finely ground cement increases, the weight of 112 to 120 lbs. per bushel, once easily attained, cannot now be reached, and the weight of a well-burned ordinary cement ground finely enough to pass through a 76 by 76 mesh sieve will be about 105 to 110 lbs.

The quality shown in checking the weight of cement is nowadays generally ascertained by calculating its specific gravity or the weight of cement as compared with the weight of an equal volume of water or other standard substance at the same pressure and temperature. This test is carried out with facility by one or other of the simple appliances which have been devised, and the results are immediately known.

It is not, however, a test of importance, nor a test easily applied, and since it is not a general test I will not now refer to its description in detail.

Portland cement possesses a very high specific gravity on which its value as a mortar is based. All other cements have a smaller specific weight, and therefore cannot form a mortar of equal density and resisting power. The specific gravity of Portland cement varies between 2.90 and 3.20.

Similarly, in regard to the chemical composition of cements, it may be said that this test will render valuable services in the detection of adulteration, and it is of use also in determining whether certain constituents believed to be harmful in cements, such as magnesia and sulphuric anhydride, are present in admissible proportions.

The chemical analysis of cements, therefore, if taken in conjunction with the mechanical and physical tests, affords much desirable information in the selection of a good quality material; indeed, it is almost necessary that both the chemical and mechanical examination of a cement should be made before the positive pronouncement of quality can be given, and when both have been ascertained the suitability and efficiency of a cement for any given purpose can be at once accurately determined.

Since, however, this work of the chemical analyses must be carried out by qualified chemists, and which is rarely called for, I will, therefore, also only give a passing reference to this test.

It might here also be mentioned, in conclusion, that in addition to testing cements by the chemical and physical tests according to well-known standards and theories, the average consumer generally tests the qualities of cement by practical results, preferring to watch the action of cement in work rather than rely upon the qualities as shown by the laboratory records. However, this "practical" test, be it said, is far more likely to give erratic results as to the qualities of cements, and with far more serious consequences, than any of the recognised theoretical tests above mentioned, for there are innumerable ways in which a perfectly satisfactory quality cement by faulty manipulation may be made to appear otherwise, and there are again many aggregates which destroy the otherwise sound qualities of many products of proved first-class quality.

This practical test is often the parting of the ways between manufacturer and consumer, and in addition to being extremely unscientific, the test is fair to neither the one nor the other; and in the event of unsatisfactory concrete work ensuing, two distinct and definite courses are adopted by the cement maker and the purchaser, the one stating that he is only responsible for the quality of his cement, and the other that he is not responsible for any faulty work carried out with the cement he purchases.

THE

# Architect and Contract Reporter.

FRIDAY, MARCH 11, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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*** *Entered in the United States of America as second-class matter.*

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## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Blyth.—March 12.—The Governors of the Blyth Secondary school invite architects with offices in Northumberland, Durham, or Newcastle-upon-Tyne, to submit plans for a secondary school to accommodate 280 pupils, and caretaker's house. The assessor appointed is Mr. J. A. Gotch, F.R.I.B.A., F.S.A. Mr. Thomas R. Guthrie, Clerk to the Governors, Blyth.

Liverpool.—The Corporation invite designs from architects practising in Liverpool for a branch library estimated to cost not more than 7,000*l*. Mr. W. E. Willink, F.R.I.B.A., will act as assessor. Apply to Mr. E. R. Pickmere, town clerk, Reference Library, William Brown Street, Liverpool.

Scotland.—March 21.—The Renfrew Parish Council invite plans and estimates for offices to be erected at Blawarthill, Yorker Road, near Scotstoun West Station. Deposit 10*s*. No premium. The Clerk to the Council, 1 Manse Street, Renfrew.

Sheffield.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Will be returned to those who send plans to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

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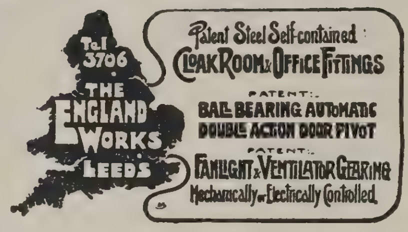

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Ashburton.—March 31.—For an addition to the Ashburton and Buckfastleigh Cottage Hospital. Mr. H. Mallaby Firth, hon. secretary, Ashburton, Devon.

Barnwood.—March 24.—For erection of a general bathhouse on the female side of the second county asylum at Barnwood, near Gloucester. Deposit 1*l*. 1*s*. The Clerk of the Works, Wotton Asylum, Gloucester. Messrs. Giles, Gough & Trollope, architects, 28 Craven Street, Charing Cross, London, W.C.

Bilston.—March 14.—For alterations to the Assembly Room and approaches at the Town Hall. Mr. V. Turner, A.M.I.C.E., engineer and surveyor, Town Hall, Bilston.

Bradford.—March 16.—For all trades in erection of St. Clement's Vicarage, Barkerend Road. Mr. Horace E. Priestley, M.S.A., architect and surveyor, 4 Bertram Road, Manningham, Bradford.

Braintree.—March 12.—For relaying the wood block floors of the mixed department of the Bocking End Council school. Mr. J. Gleave, clerk, Education Office, County High School, Braintree, Essex.

Brighton.—March 15.—For erection and completion of eight double-tenement houses, together with sundry works connected therewith, in Tillstone Street, for the Town Council. The Borough Surveyor, Town Hall, Brighton.

Brimscombe.—March 19.—For alterations required at the Polytechnic. The Secretary, Polytechnic, Brimscombe.

Burghill.—March 24.—For erection of an isolation hospital and other contingent works at Burghill, Hereford. Deposit 1*l*. 1*s*. The County Surveyor, Shirehall, Hereford.

Chester.—March 14.—For new female epileptic ward at the Upton Asylum. Deposit 1*l*. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Chopwell.—March 19.—For the erection and completion of a new branch at Chopwell, Durham, for the Annfield Plain Industrial Co-operative Society, Ltd. Deposit 2*l*. 2*s*. Mr. George Thomas Wilson, architect, 22 Durham Road, Blackhill, Co. Durham.

Cirencester.—April 2.—For the demolition of buildings adjoining the police station, and construction of a new superintendent's house upon the site. Deposit 2*l*. Mr. E. S. Sinnott, M.I.C.E., county surveyor, Shirehall, Gloucester.

Dartmouth.—March 18.—For an addition to the clergy vestry at St. Saviour's Church. Mr. Braithwaite, The Quay.

Dewsbury.—March 18.—For the whole or any part of the work required in extension of shed, new stone house, &c., at West Field Mills, Dewsbury Moor. Messrs. Holtom & Fox, architects, Corporation Street, Dewsbury.

East Budleigh.—March 16.—For erection of a store at East Budleigh station, Devon. Mr. P. Kerley, architect and surveyor, National Provincial Bank Chambers, Exmouth.

Eccles.—March 21.—For erection and completion of extension to the electricity station, Cawdor Street, Patricroft. Deposit 10*s*. 6*d*. Mr. N. Hartley Hacking, 50 Blackfriars, Manchester.

Exmouth.—March 14.—For erection of detached house near Woodbury Road station. Mr. Ernest E. Ellis, architect, Exmouth.

Fareham.—March 22.—For the erection of a hospital block at the isolation hospital. Deposit 3*l*. 3*s*. Apply by March 12 to Mr. Wilberforce Cobbett, architect, Fareham, Hants.

Ferryhill.—March 21.—For erection of an inspector's house near Ferryhill Station, with outbuildings and storehouse, for the Weardale and Consett Water Company. Mr. Askwith, M.I.C.E., resident engineer, South Road, Bishop Auckland, and at the Company's office, North Road, Durham.

Frizington.—March 14.—For erection and completion at Frizington of the following gasworks buildings, viz.:—Retort house, coal stores, manager's house, and other buildings. Mr. George Ashbridge, engineer, at the Gasworks Site, Frizington, Cumberland.

Gateshead.—March 31.—For erection of the Brighton Avenue new school. Deposit 1*l*. 1*s* Mr. F. W. Purser, architect, West Street, Gateshead.

Glasgow.—March 21.—For (1) structural steel work, (2) builder's work in connection with the provision of a new roof, Glasgow Cathedral, for the Commissioners of His Majesty's Works and Public Buildings. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow (Hanover Street entrance).

Glasgow.—March 21.—For the adaptation of premises, 31 Prince Edward Street, Glasgow, for the purposes of a telephone exchange, for the Commissioners of H.M. Works and Public Buildings. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow.

Goole.—March 19.—For erection of farm buildings at the Moors Farm, Swinefleet Common. Mr. H. B. Thorp, architect and surveyor, Goole.

Great Yarmouth.—March 12.—For rebuilding the Two Bears Hotel. Deposit 2*l*. 2*s*. Surveyor's Office, Morgan's Brewery Co., Ltd., Norwich.

Hartlepool.—March 17.—For erecting fish quay agents and dock dues offices, Victoria Dock, for the North-Eastern Railway Co. Apply the Stationmaster at Hartlepool and Mr. William Bell, the Company's architect, at York.

Haslingden (Lancs).—March 21.—For the whole of the work required in erection of a farm house adjoining the present Union farm buildings, for the Guardians. Deposit 1*l*. 1*s*. Mr. A. Brocklehurst, architect, St. James's Chambers, Waterfoot.

Hensingham.—March 19.—For alterations and additions to property adjoining Old Mill, Hensingham, Cumberland. Messrs. J. S. Moffat & Bentley, architects, 53 Church Street, Whitehaven.

Horsforth, near Leeds.—March 18.—The West Riding education committee invite whole or separate tenders for the following work:—New mixed and infants' school and special subjects block at Horsforth (near Leeds):—Builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Deposit 1*l*. with the West Riding Treasurer, County Hall, Wakefield.

Hull.—March 14.—For the erection of a school in Southcoates Lane. Deposit 2*l*. 2*s*. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Ireland.—March 14.—For the erection of workmen's dwellings in Kilmainham, for the Dublin Corporation. Deposit 2*l*. The City Architect, Municipal Buildings, Cork Hill, Dublin.

Ireland.—March 14.—For erection of an auxiliary creamery at Aclare, Co. Sligo. Mr. Thomas H. Murricane, manager and secretary. The Tubbercurry Co-operative Agricultural and Dairy Society, Ltd., Tubbercurry.

Ireland.—March 19.—For building a school at Hilden, Co. Down, for Messrs. William Barbour & Sons, Ltd. Mr. W. J. Fennell, F.R.I.B.A., architect, 2 Wellington Place, Belfast.

Ireland.—March 21.—For erection of residence at Abbeylands, Navan. Deposit 1*l*. 1*s*. Mr. R. Barnes, Tatestown, Navan.

Ireland.—March 21.—For the re-building of the Guildhall, Londonderry, for the Corporation. The City Architect, Municipal Offices, Foyle Street, Londonderry.

London.—March 15.—For the extension of the roof at Brentford Dock, for the Great Western Railway Co. The Engineer at Paddington Station, London.

London.—March 16.—For the construction and erection of public baths at Western Road, for the Wood Green Urban District Council. Deposit 5*l*. at the Clerk's Office. Mr. Harold Burgess, architect, Capel House, 62 New Broad Street, E.C.

Loughton.—March 16.—For erection of a public elementary school with the accommodation for 306 girls in the Staples Road. Mr. H. Tooley, F.R.I.B.A., Buckhurst Hill. Deposit 4*l*. 4*s*. Apply by March 16 to Mr. Herbert J. Goodwin, clerk to district sub-committee, High Road, Loughton, Essex.

Maryport.—March 21.—For the various artificers' work required in connection with the Central Hall. Mr. J. N. Singleton, architect, 61 Lowther Street, Whitehaven.

Merstham (Surrey).—March 11.—For alterations and additions to farm buildings, Netherne Asylum. Deposit 2*l*. Apply by March 11 to Messrs. George T. Hine & H. Carter Pegg, architects, 35 Parliament Street, Westminster.

Mexborough.—March 14.—For erection of six almshouses and other works incidental thereto at Church Street. Deposit 1*l*. Mr. G. Fenwick Carter, C.E., surveyor, Council Offices, Mexborough.

North Shields.—March 16.—For erection of North Shields telephone exchange, for the Commissioners of H.M. Works and Public Buildings. The Postmaster, North Shields.

Ribbleton.—For erection of a parish hall and Sunday school in connection with St. Mary Magdalen, Ribbleton, Preston. Mr. H. D. Hartley, architect, 7 Lune Street, Preston.

Richmond (Surrey).—March 22.—For the construction of a pump chamber to be fixed in the Petersham Well, Petersham Meadow. Deposit 1*l*. 1*s*. Mr. W. G. Peirce, engineer, Water Works Office, Riverside, Richmond.

Scotland.—For the mason and brick work required in connection with erection of a public slaughter-house, &c., Buckhaven. Deposit 1*l.* 1*s.* Mr. William D. Telfer, burgh surveyor, Municipal Buildings, Buckhaven.

Scotland.—March 14.—For the mason and brickwork, carpenter and joiner, glazier, slater, plasterer, plumber, smith, and painter's work for erection of hall and houses at Windygates. Deposit 1*l.* 1*s.* Mr. G. Charles Campbell, architect and surveyor, Methil.

Scotland.—March 16.—For the mason, carpenter, slater, plumber, plaster, and painter's work of (1) additions and alterations at Steading, Mains of Kellas; (2) new cottage and bothy at above; (3) additions and alterations at Steading, Clash Connachie, Kellas; (4) new house, Craighead, Kellas; (5) repairs to Steading, Lochinver; (6) additions and alterations at Steading, Cairneyhillock; (7) new farmhouse at Wester Coxton; (8) alterations at House and Steading, Coldhome, on the Fife Estates, Elgin District. Mr. John Wittet, architect, Elgin.

Scotland.—March 21.—For mason, carpenter, slater, painter and glazier work of proposed Baptist Church, Buckie. Mr. George Macpherson, architect, Buckie.

Sheffield.—March 14.—For the whole of the works required in erection of new infant department for 468 places at Owler Lane Council school. The City Architect, Town Hall, Sheffield.

Southend-on-Sea.—March 15.—For the extension of the existing car shed at the Corporation depôt, London Road. Deposit 1*l.* 1*s.* Mr. Ernest J. Elford, C.E., borough engineer and surveyor, Southend-on-Sea.

Sowerby Bridge.—March 14.—For the mason and bricklayer, carpenter and joiner, slater and plasterer, plumber and glazier, cast-iron and steel, concretor and painter work required in erection of a five-storey cotton mill, Walton Street. Mr. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

St. Helens.—March 21.—For erection of a school in North Road. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens, Lancs.

Sturminster Marshall.—March 24.—For building an elementary school at Sturminster Marshall, Dorset. The County Surveyor, Wimborne.

Tinsley.—March 25.—For the following works for the Parish Council:—(1) Constructing a fence wall, and (2) wrought iron railings and gates for enclosing the recreation ground. Mr. J. L. Winkley, clerk, 15 Harrowden Road, Tinsley, Sheffield.

Torquay.—March 19.—For heavy steel and iron constructional works required in erection of the proposed pavilion at Torquay, for the Town Council. Constructional engineers desirous of tendering are invited to forward their names, together with a deposit of 3*l.* 3*s.*, to Mr. Frederick S. Hex, town clerk, Town Hall, Torquay.

Torquay.—March 19.—The Town Council of Torquay are about to invite tenders for the erection of new town hall, municipal buildings, and offices. Forward names (together with a deposit of 5*l.* 5*s.*) to Mr. Fredk. S. Hex, town clerk, Town Hall, Torquay.

Wakefield.—March 19.—For the following work, viz.:—Erection of two rooms, County Hall, for the West Riding general purposes committee. The West Riding Architect, County Hall, Wakefield.

Wales.—March 14.—For the following works for the Glamorgan County Council, viz.:—(1) New mixed school at Cwmlai (Ely Valley); (2) new intermediate school for girls at Barry; (3) new intermediate school for girls at Aberdare. The Glamorgan County Council Offices, Cardiff.

Wales.—March 14.—For pulling down and erecting new business premises at Brynmawr. Mr. Hy. Walters, M.S.A., architect, Market Chambers, Ebbw Vale.

Wales.—March 14.—For erection of a Council school, to accommodate 600 children, at Crumlin, Mon. Deposit 2*l.* 2*s.* Mr. John Bain, architect, County Council Offices, Newport.

Wales.—March 15.—For erection of a church at Newbridge, Mon. Deposit 1*l.* 1*s.* Mr. John W. Aldiss, M.S.A., architect and surveyor, Newbridge, Mon.

Wales.—March 15.—For alterations and additions to the Raglan Police Station, Monmouth. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Newport, Mon.

Wales.—March 17.—For erection of two managers' houses at Clydach Vale, for the Cambrian Collieries, Ltd. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

Wales.—March 17.—For erection of about 70 houses at Cwm, Mon., for the Cwm Building Co., Ltd. Mr. Edwin F. Jones, architect, the Central Offices, Ebbw Vale.

Wales.—March 18.—For the rebuilding of the Berrington Arms and stables, Cwmtwrch. Mr. J. Cook Rees, architect, Parade Chambers, Neath.

Wales.—March 31.—For alterations and additions to Maesydderwen to convert into county schools, for the Governors of the Ystradgynlais County School. Mr. J. Cook Rees, architect, Neath. Sealed tenders to be sent to Mr. B. L. Thomas, clerk to the Governors, Tir Roger, Ystradgynlais, by March 31, endorsed "Tender for schools."

Watford.—March 23.—For supply and erection of a steel and corrugated iron building, size 29 feet by 30 feet by 24 feet high. Mr. D. Waterhouse, engineer to the Council, High Street, Watford.

Workington.—March 18.—For the various works required in extensions to the drill hall, Edkin Street. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

# TENDERS.

## ASHBY.

For erecting an elementary school at Ashby, near Scunthorpe, for Lindsey County Council education committee. Messrs. Scorer & Gamble, architects, Lincoln.

| | | | |
|---|---|---|---|
| Hollingsworth | £3,793 | 6 | 4 |
| Barker & Sons | 3,350 | 0 | 0 |
| Elmes | 3,350 | 0 | 0 |
| Wright & Son | 3,287 | 0 | 0 |
| Scarborough | 3,276 | 16 | 0 |
| Mawer Bros. | 3,274 | 0 | 0 |
| Thompson | 3,224 | 0 | 0 |
| Pumfrey | 3,128 | 0 | 0 |
| Hickman, Market Harborough (*accepted*) | 3,064 | 0 | 0 |

## ASHFORD.

For drill hall in New Town Road. Messrs. Worsfold & Hayward, architects and surveyors, Dover.

| | | | |
|---|---|---|---|
| Bourne | £5,650 | 0 | 0 |
| Epps | 5,596 | 0 | 0 |
| West Bros. | 5,449 | 0 | 0 |
| Stiff | 5,349 | 0 | 0 |
| T. T. Denne | 5,293 | 0 | 0 |
| Paramor | 5,274 | 0 | 0 |
| Knock | 5,239 | 0 | 0 |
| G. H. Denne | 5,185 | 0 | 0 |
| Skinner | 5,140 | 0 | 0 |
| Browning | 5,119 | 0 | 0 |
| Wallis & Sons, Maidstone (*accepted*) | 5,079 | 0 | 0 |
| Architects' estimate | 5,200 | 0 | 0 |

## BEACONSFIELD.

For the reconstruction of the public highway known as the Station and Penn Road, Beaconsfield, for the Urban District Council. Mr. H. Sargeant, surveyor.

| | | | |
|---|---|---|---|
| Bowyer | £10,110 | 17 | 10 |
| Kavanagh & Co. | 9,990 | 16 | 0 |
| Davies, Ball & Co. | 9,632 | 3 | 10 |
| Hamilton | 8,817 | 4 | 10 |
| Langley & Johnson, Slough (*accepted*) | 8,463 | 0 | 9 |
| Lee & Son | 8,353 | 6 | 1 |
| Engineer's estimate | 8,680 | 1 | 3 |

## BISHOP'S CASTLE (SALOP).

For work, &c., in connection with the Bishop's Castle sewerage and sewage disposal works. Messrs. Willcox & Raikes, engineers, Birmingham.

| | | | |
|---|---|---|---|
| Rennie & Thompson | £5,281 | 0 | 0 |
| Braithwaite & Co. | 5,151 | 14 | 5 |
| Bell & Sons | 4,920 | 0 | 0 |
| Oxley & Son | 4,788 | 16 | 0 |
| Castle & Co. | 4,697 | 7 | 0 |
| Barry | 4,550 | 0 | 0 |
| Deakin | 4,547 | 0 | 0 |
| Jowett Bros. | 4,443 | 4 | 6 |
| Wickstead & Co. | 4,352 | 10 | 4 |
| Henson & Son | 4,314 | 0 | 0 |
| Vale & Sons | 4,252 | 0 | 0 |
| Morley & Sons | 4,244 | 14 | 5 |
| Mason | 4,181 | 3 | 0 |
| Godwin | 4,170 | 0 | 0 |
| Brebner & Co. | 4,134 | 15 | 0 |
| Thomas | 4,123 | 0 | 0 |
| Cottle | 4,077 | 11 | 11 |
| Hill & Co., Kidderminster (*accepted*) | 4,006 | 6 | 0 |
| Engineer's estimate | 4,060 | 0 | 0 |

### BROXBOURNE (HERTS).

For the construction of a road (about 500 yards in length), being the first portion of the new roads on the Broxbournebury Estate development scheme. Mr. Dudley Newman, architect and surveyor.

| | | | |
|---|---|---|---|
| Wall | £2,798 | 0 | 0 |
| Laurence & Son | 2,054 | 0 | 0 |
| Ekins & Co. | 1,960 | 13 | 6 |
| Hunt (*accepted*) | 1,889 | 0 | 0 |

### ENFIELD.

For the construction of pumping-station buildings, Hadley Road, for the Metropolitan Water Board.

| | | | |
|---|---|---|---|
| J. & M. Patrick | £11,941 | 0 | 0 |
| Fitch & Cox | 11,905 | 0 | 0 |
| Stewart | 11,858 | 0 | 0 |
| Wickstead & Co. | 11,329 | 15 | 6 |
| Coles | 11,128 | 6 | 5 |
| Dick, Kerr & Co. | 11,028 | 18 | 4 |
| Shurmur & Sons | 10,977 | 0 | 0 |
| W. Lawrence & Sons | 10,584 | 0 | 0 |
| Appleby & Sons | 10,540 | 0 | 0 |
| Kirk & Randall | 10,492 | 0 | 0 |
| Parsons | 10,337 | 0 | 0 |
| Terry & Co. | 10,294 | 0 | 0 |
| Wall | 10,287 | 0 | 0 |
| Spencer, Santo & Co. | 10,228 | 0 | 0 |
| Davey | 10,145 | 1 | 9 |
| Monk | 10,100 | 0 | 0 |
| Foster & Dicksee | 9,998 | 0 | 0 |
| Lowe & Co. | 9,988 | 0 | 0 |
| Blake | 9,965 | 0 | 0 |
| Henson & Co. | 9,672 | 14 | 7 |
| Clark & Sons | 9,605 | 0 | 0 |
| E. Lawrence & Sons | 9,585 | 0 | 0 |
| Moss & Sons | 9,562 | 0 | 0 |
| Fairhead & Son | 9,444 | 0 | 0 |
| Nightingale | 9,421 | 0 | 0 |
| Porter, Tottenham (*accepted*) | 9,311 | 0 | 0 |

### KEADBY.

For six dwelling-houses at Keadby, Doncaster. Mr. George Sinclair, architect, Crowle, Lincs.

| | | | |
|---|---|---|---|
| Thompson | £949 | 0 | 0 |
| Loughton | 945 | 0 | 0 |
| Stacy Bros. | 900 | 0 | 0 |
| Teanby, Ealand, Crowle (*accepted*) | 835 | 0 | 0 |

### KEDINGTON.

For erection of a brick tower and tank for water storage in connection with the water supply at Kedington workhouse, near Haverhill. Mr. G. E. Mitchell, A.R.S.I., surveyor, Clare, Suffolk.

| | | | |
|---|---|---|---|
| Gibbons Bros. | £359 | 10 | 0 |
| Bennett | 300 | 0 | 0 |
| Mason & Son | 277 | 10 | 0 |
| Bareham & Son, Clare (*accepted*) | 265 | 4 | 0 |

### LANCASTER.

For the proposed closed house for noisy, troublesome, and dangerous cases, at the County Lunatic Asylum, Lancaster. Mr. H. Aspinall, F.R.I.B.A., architect, 36 Dale Street, Liverpool.

| | | | |
|---|---|---|---|
| Webster | £11,850 | 0 | 0 |
| Hughes & Stirling | 10,580 | 0 | 0 |
| Morrison & Sons | 10,400 | 0 | 0 |
| Kitchen | 9,918 | 3 | 0 |
| Huntington | 9,720 | 0 | 0 |
| Hatch & Sons | 9,594 | 0 | 0 |
| Dilworth | 9,499 | 0 | 0 |
| Parkinson | 9,475 | 0 | 0 |
| Wright & Sons | 9,380 | 0 | 0 |
| Thoms | 9,356 | 0 | 0 |
| Tyson | 9,190 | 0 | 0 |
| Thompson, Lancaster (*accepted*) | 9,100 | 0 | 0 |

### NORWICH.

For addition to Wincarnis Works. Messrs. Morgan & Buckingham, architects, Norwich.

| | | | |
|---|---|---|---|
| Hawes & Son | £2,296 | 0 | 0 |
| Gill & Son | 2,215 | 0 | 0 |
| Smith | 2,200 | 0 | 0 |
| Youngs & Son | 2,145 | 0 | 0 |
| Hannant | 2,067 | 0 | 0 |
| Anderson & Son | 1,925 | 0 | 0 |

### OATLANDS PARK.

For house in Oatlands Drive. Messrs. Crickmay & Sons, architects and surveyors, 13 Victoria Street, Westminster, and Weymouth, Dorset.

| | | | |
|---|---|---|---|
| Hill & Sons | £2,497 | 0 | 0 |
| Willis | 2,400 | 0 | 0 |
| Greenfield | 2,218 | 18 | 0 |
| Ranger | 2,085 | 0 | 0 |
| Gaze & Sons | 2,023 | 0 | 0 |
| Annett | 1,994 | 0 | 0 |
| Drowley & Co. | 1,938 | 0 | 0 |
| Jarvis | 1,929 | 14 | 0 |
| Trask & Sons | 1,921 | 0 | 0 |
| Nicholson, Weybridge (*accepted*) | 1,705 | 0 | 0 |

### ROMFORD.

For the construction of about 550 yards of 12-inch stoneware pipe sewer and for the making up of the following private streets at Chadwell Heath, in the parish of Dagenham, viz.:—Albany Road, Gordon Road, Hainault Road, Whalebone Road, Whalebone Avenue. Mr. W. J. Grant, surveyor.

| | | | |
|---|---|---|---|
| Free & Sons | £5,944 | 13 | 7 |
| Wickstead & Co. | 5,815 | 7 | 0 |
| Jackson | 5,583 | 0 | 6 |
| Griffiths & Co. | 5,460 | 14 | 10 |
| Parsons & Parsons | 5,355 | 2 | 4 |
| Trueman | 5,353 | 13 | 0 |
| Adams | 5,222 | 8 | 9 |
| Stroud | 4,853 | 3 | 10 |
| Wilson, Border & Co. | 4,803 | 3 | 2 |
| Glenny, Romford (*accepted*) | 4,428 | 5 | 6 |
| Surveyor's estimate | 5,470 | 0 | 0 |

### ST. MARGARET'S.

For residence at St. Margaret's, near Dover. Messrs. Worsfold & Hayward, architects and surveyors, Dover.

| | | | |
|---|---|---|---|
| Austen & Lewis | £764 | 0 | 0 |
| Roffey & Sons | 688 | 0 | 0 |
| Tapley | 649 | 0 | 0 |
| Parsons | 635 | 0 | 0 |
| Paramor, Dover (*accepted*) | 598 | 0 | 0 |

### SEAFORD.

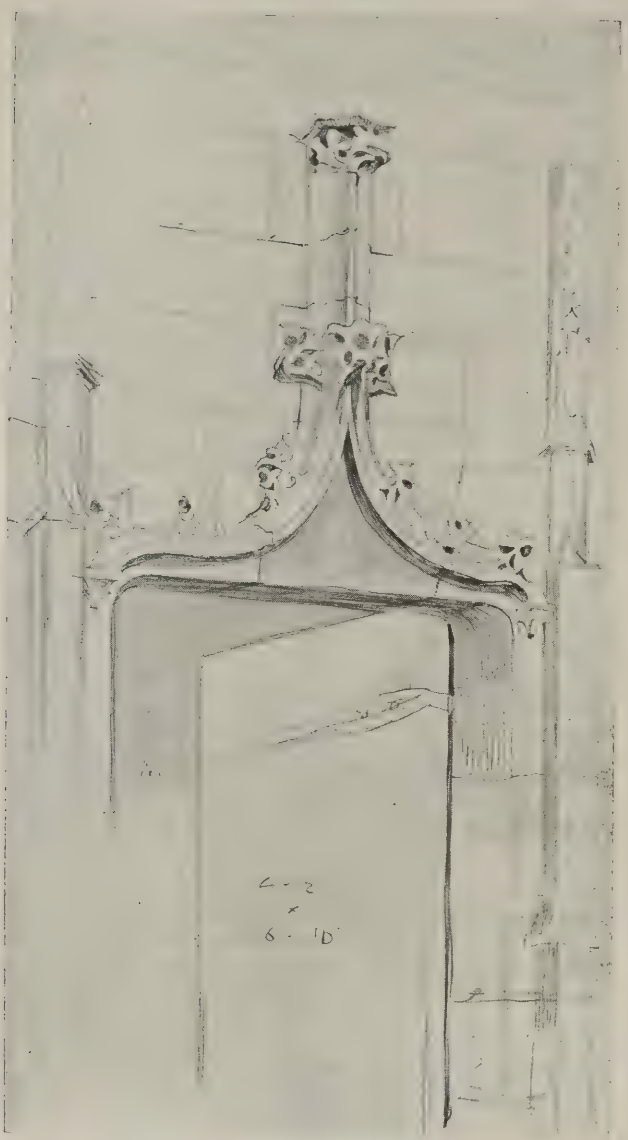
For main sewerage works, Contract No. 5. Messrs. Pollard & Tingle, engineers, 31 Old Queen Street, Westminster.

| | | | |
|---|---|---|---|
| Hill & Co. | £16,861 | 11 | 10 |
| Pedrette | 16,284 | 15 | 4 |
| Pethick Bros. | 15,995 | 0 | 0 |
| Miskin | 15,523 | 0 | 0 |
| Murray & Co. | 15,124 | 15 | 9 |
| Higgins | 14,550 | 0 | 0 |
| Brebner & Co. | 14,159 | 4 | 0 |
| J. & T. Binns | 13,870 | 8 | 7 |
| Wickstead & Co. | 13,843 | 8 | 9 |
| Ewart | 13,770 | 0 | 0 |
| Bell & Sons | 13,690 | 0 | 0 |
| Muirhead & Co. | 13,512 | 13 | 3 |
| Oxenton | 13,001 | 0 | 0 |
| Johnson & Langley | 12,765 | 0 | 6 |
| Johnson Bros. | 12,667 | 7 | 7 |
| Paterson, Camden Town (*accepted*) | 12,625 | 10 | 0 |
| Wright & Co. | 11,966 | 2 | 1 |

### WITHAM.

For the installation of a new vertical steam boiler and shed at the Bridge Industrial Home, Essex, for the Metropolitan Asylums Board. Mr. W. T. Hatch, engineer-in-chief.

| | | | |
|---|---|---|---|
| Clayton, Son & Co. | £360 | 0 | 0 |
| Davey, Paxman & Co. | 343 | 0 | 0 |
| Summerscales & Sons | 318 | 0 | 0 |
| Thompson | 275 | 0 | 0 |
| Gimson & Co. | 270 | 0 | 0 |
| Dodman & Co. | 267 | 13 | 0 |
| Cradley Boiler Co. | 259 | 10 | 0 |
| Westminster Ventilating Co. | 226 | 0 | 0 |
| Wenham & Waters | 210 | 0 | 0 |
| Prockter & Kenyon | 208 | 5 | 0 |
| J. & F. May | 203 | 10 | 0 |
| General Iron Foundry Co., 43 Upper Thames Street (*accepted*) | 159 | 0 | 0 |



AT CHATEAU FERVACQUES.
Drawn by A. N. PRENTICE, F.R.I.B.A.

### WALES.

For erection of a cottage at Clytha, Mon. Mr. WILLIAM TANNER, F.S.I., county surveyor, Newport.

| | | | |
|---|---|---|---|
| Jones | £630 | 0 | 0 |
| Foster & Hill | 595 | 0 | 0 |
| Williams | 580 | 0 | 0 |
| Prosser | 575 | 0 | 0 |
| P. P. Leadbeter & Co. | 569 | 0 | 0 |
| Thomas & Son | 565 | 0 | 0 |
| Boyt | 560 | 5 | 0 |
| G. F. Leadbeter | 558 | 15 | 0 |
| Reed | 498 | 0 | 0 |
| Burgoyne & Son | 495 | 0 | 0 |
| POULTON & WHITING, Pontnewydd (*accepted*) | 487 | 0 | 0 |

### WALTON-ON-THAMES.

For house on the Adelaide Road estate. Messrs. CRICKMAY & SONS, architects and surveyors, 13 Victoria Street, Westminster, and Weymouth, Dorset.

| | | | |
|---|---|---|---|
| Hill & Sons | £1,270 | 0 | 0 |
| Greenfield | 1,218 | 0 | 0 |
| Willis | 1,108 | 15 | 0 |
| Nicholson | 1,093 | 0 | 0 |
| Gaze & Sons | 1,051 | 0 | 0 |
| Trask & Sons | 1,048 | 0 | 0 |
| Ranger | 1,020 | 0 | 0 |
| Drowley & Co. | 1,014 | 0 | 0 |
| ANNETT, Walton-on-Thames (*accepted*) | 995 | 0 | 0 |

## COMPETITIONS.

DUMBARTON.—The School Board have received six sets of plans for the proposed academy and higher grade school at Braehead, N.B. Mr. S. Preston, master of works to the Govan Parish School Board, has been appointed assessor.

PORT BANNATYNE.—Mr. A. Balfour, F.R.I.B.A., I.A., has been successful in the competition organised by the Kyles of Bute Hydropathic Company for rebuilding their premises at Port Bannatyne which were recently destroyed by fire. The competition was limited to three Glasgow architects.

OLDHAM.—Messrs. Taylor & Simister have been awarded the first premium of 50*l*. offered by the Town Council to architects practising or residing within the borough for an extension of the town hall. The assessor was Mr. G. H. Willoughby, F.R.I.B.A., of Manchester. The designs will be on view at the town hall on March 12, 14, and 15.

WATERLOO.—The designs submitted in competition with twelve others by Messrs. George Baines & Son, 5 Clement's Inn, Strand, W.C., for the Liverpool Waterloo Baptist church and schools have been adopted, and the scheme is to be at once proceeded with. The estimated cost, exclusive of tower, is about 4,500*l*.

## CORRESPONDENCE.

### Re Arbitration where Party Walls are Interfered With.

SIR,—Will you kindly inform me through your columns, where building owner has an award agreed upon with the adjoining freeholder's surveyor, as to whether, if his building is let out as offices on lease or three years' agreement, say on all floors, each of his tenants can claim a separate award protecting himself as against adjoining owner, who is either pulling down said wall, or say building new chimney breasts against it, and raising or building new chimney shafts on roof, or whether each tenant must look to his landlord, i.e., the freeholder, for protection against damage done to his offices? In the text books I cannot find it clearly stated as to the law in the matter, as it seems to me this may mean immense expense and trouble to the building owner in the event of probably a dozen or more awards being necessary.—I am, yours truly,

STUDENT.

REPLY.—In the case you mention each tenant must look to his landlord for protection against damage done to the property tenanted. It is the landlord's duty to secure quiet enjoyment to his tenant.

THE Manchester City Council have formally given notice of their intention to erect a public elementary school for about 1,200 children at Gorton.

THE Builders' Clerks' Benevolent Institution held their forty-third annual meeting at 21 New Bridge Street, E.C., last week, Mr. Leonard Horner, the President, occupying the chair. It was reported that the sum of 703*l*. had been paid in pensions, and 23*l*. 6*s*. 6*d*. disbursed in affording temporary relief. There are now twenty-eight widows and two aged clerks receiving pensions. The Hon. Treasurer (Mr. E. Brooks) presented the balance sheet, which showed that the institution had invested funds to the amount of 7,842*l*. Mr. William Downs was elected President for the ensuing year.

THE London Master Builders' Association held their annual meeting on February 28. Mr. Leonard Horner was elected president, and Mr. G. Bird Godson and Mr. Jas. S. Holliday vice-presidents for the coming year. The Council has acquired new premises in a building now being erected in Kingsway, to which the business of the Association will be transferred in due course. Members are reminded that the offices are available for private business appointments, and it is hoped the increased accommodation in the new premises will be of service.

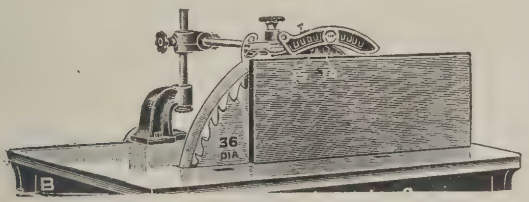
THE *Board of Trade Journal* states that the *Gaceta de Madrid* publishes a notice inviting tenders for enlarging and altering the building of the Faculty of Medicine at the University of Santiago de Compostela. The upset price is put at about 97,000*l*., and a deposit of about 2,900*l*. will be required, to be increased by the successful tenderer to 10 per cent. of the accepted contract price. Tenders should be sent before April 6. Tenders are also invited for the construction of a building for a Royal Academy of Medicine at Madrid. The upset price is placed at about 22,600*l*., and a deposit of about 680*l*. will be required, to be increased by the successful tenderer to 10 per cent. of the accepted contract price. Tenders for both works should be addressed to the "Ministerio de Instrucción Pública y Bellas Artes," Madrid, where they will be opened at 1 P.M. on March 31. Local representation is necessary in both cases.

## THE MANCHESTER BUILDING TRADES EXHIBITION.

The opening ceremony of the Manchester Building Trades Exhibition was performed on Tuesday, the 8th inst., at the City Exhibition Hall, by Sir William H. Bailey (head of W. H. Bailey & Son), the chair being occupied by the Mayor of Salford. In an able speech Sir William Bailey pointed out the benefits to be derived from all exhibitions which brought the buyer into closer contact with the manufacturer and the merchant. An exhibition like the present one was calculated to raise the standard of decoration introduced into the homes of the people, while at the same time it demonstrated the improved facilities now available for heating and ventilating as well as the general improvement in sanitary conditions. Sir William dealt at some length with the opportunities offered to local authorities for dealing with overcrowding in cities by the new Town Planning Act, and he made an earnest appeal for its application to Manchester and Salford where densely populated areas were to be found.

The City Exhibition Hall is situated in Liverpool Road, off Deansgate. It is claimed to be the finest hall of the kind in the provinces. The building is undoubtedly compact, accessible and well-lighted. The exhibition itself must be regarded as a distinct success and as reflecting great credit on Mr. W. Cawood, the promoter, who for the first time has produced something fully entitled to be called a Building Trades Exhibition. The hall is filled with exhibits, which are all directly connected with the building industries and of interest to architects as well as the trade and the general public. Perhaps the only disappointing feature is the want of enterprise shown by sanitary potters and engineers. The display of this class of goods is a comparatively poor one and very unrepresentative of the great firms of the country. Their absence is all the more surprising as, owing to the ever-increasing amount of attention being paid to sanitary science, it would appear to be well worth the while of enterprising firms to take every opportunity of bringing themselves prominently before the public notice. A genuine, if vague, desire for improved sanitary conditions is general; it now remains for the sanitary specialists to crystallise and guide that tendency. The quickest way to accomplish this is by seeking all the publicity possible.

*M. Glover & Co.*, Engineers, Holbeck Lane, Leeds, show their wood-working machinery at Stand No. 14, including working models of ingenious firewood splitting and bundling machines. Prominent is the "Ideal" saw guard here illustrated which can be easily and accurately adjusted to fit different diameters of saws. It has a very improved form of riving knife and permits sawing to the full depth without it being necessary to elevate the guard or riving knife. The "Ideal" guard consequently affords absolute protection. Another interesting speciality in operation is the patent Circular Safety Cutter Block for wood-planing and moulding machines. The new cutter makes it quite impossible for the workman to receive more than slight flesh wounds at the tips of his fingers, and at the same time it makes the planing more perfect. The knives are both lighter and cheaper. They are firmly held close to the cutting point and work with much less vibration than the hitherto heavy unsupported knives. Glover's saw-sharpening machine is strong, occupies small space, and is very rigid while working at full speed. Thousands of these machines are giving the greatest satisfaction. Messrs. Glover are also showing an improved saw bench and a new improved "Universal" vice. In the vice generally used there is not enough room between the jaws and the screw case to allow of long objects being held vertically. This is provided for in the "Universal," the screw and bottom part being arranged out of the way of the work extending downwards. It is equipped with a swivel jaw moving on a ball and socket joint to receive taper work. Also on exhibition is a compact appliance for making window frames which the firm are just introducing, and which they say will revolutionise this class of work.



GLOVER'S "IDEAL" SAW GUARD.

*Messrs. W. Hilton & Sons*, Moss Side Steam Marble Works, Manchester, show at Stand No. 15 specimens and photographs of work they have carried out in Lancashire. One of their exhibits is a staircase with one baluster in English coloured alabaster and the other in Caen stone; the two different designs and materials suggest in use different purposes. The stand also includes panelling in various marbles, as well as examples of turning stone executed for the Manchester Infirmary, and photographs of various contracts.

*Messrs. Tutin & Co.*, Manchester, have erected on Stand 18 a building of two rooms with walls constructed of their "Salamander" brick partitions. These are obtainable in four sizes—the 10 inches by 4 inches blocks are made in thicknesses of 1½ inches, 2¼ inches, and 3 inches, while the fourth size is 4 inches by 10 inches by 6 inches. For the outside walls of this stand 4-inch and 3-inch bricks are used, for the inside partitions 3-inch blocks. The "Salamander" partitions are hollow fireproof blocks made by a special process. They will take nails and can be easily sawn. The blocks are moulded so as to interlock, and the surface is keyed for tiles or plaster. Architects are already familiar with hollow blocks for exterior and interior use in floors, walls, roofs, and partitions. The "Salamander" bricks are a valuable addition to the existing varieties. It might be mentioned that a partition has just been erected of them in Manchester by Messrs. Tutin & Co. 90 feet long by 20 feet high.

*Messrs. C. Jennings & Co., Bristol*, have a varied collection of their woodwork at Stand 26. It includes doors, gates, elaborate fretwork grilles, a shop front, balusters, and general woodwork. Not an inch of space has been wasted in the effort to convey an idea of the diversity of output from the joinery works in Pennywell Road, Bristol, where they cater for the requirements of mansion and cottage with equal readiness, and where they wage war against the invasion of foreign goods.

The *Saxon Portland Cement Co., Ltd.*, have done their best to compensate those visitors who cannot journey to their Norman and Saxon Works at Cambridge by displaying at Stand 29 a sort of synopsis of the evolution of Portland cement. Samples are given of the chalk marl in its original state, and then of the material as it passes through various scientific processes before it becomes finished Saxon cement. The stand must be a pleasant relief to many visitors, who are apt to feel satiated with a collection of exhibits where everything in the way of production has to be taken for granted. Here it is possible to get some idea of the thoroughness and intricacy of manufacture involved in the production of a cement which has to come up to the standard of the Saxon Portland Cement Co.

The *Municipal School of Technology*, Manchester, supply in Stands 31 and 32 one of the features of the exhibition. The School has been at its present splendid premises in Sackville Street since 1902, but for twenty years previous the Corporation had controlled the Technical School. There are no less than 5,000 students at present attending the day and evening classes. The Municipal and Sanitary Engineering Department, whose work is here shown, numbers with the classes in architecture and building construction 718 pupils. The extremely interesting exhibit is under the direction of Professor J. Radcliffe, M.Sc., and includes examples of old and defective plumbers' work contrasting with that executed by their own students, and high-class work used for demonstration purposes. There are also various instruments and models employed for teaching, together with drawings executed by students. The two stands are intended to suggest the resources of the School for technical training by displaying what is done in a sub-section of one of the departments. The result is an unqualified success, and will undoubtedly serve to arouse still further enthusiasm for the work of the Municipal School of Technology.

The *Carron Company* occupy three Stands, Nos. 34, 35 and 36, for their products, most of which are familiar, though minor improvements are introduced when possible. Their latest cooking range, "The Carron," is shown in action, as also is the "Tyne" combination cooking and sitting-room grate. This latter has two hot-air flues which warm the two independent ovens over the fireplace. In appearance it is the same as an ordinary living-room grate, except that the mantelpiece is replaced by the oven doors.

The *Empire Stone Co., Ltd.*, 231 Strand, W.C., at Stands 37 and 38 show specimens of their much used footway paving. For architects the samples of artificial stone as supplied to many important buildings, and of mosaic, terrazzo and in situ paving will be of special interest. Empire stone can, of course, be made to match red and yellow Mansfield, Portland and other natural stones; it is unaffected by climatic conditions, and its durability is guaranteed. It lends itself in an especial manner to carving and general high finish. A floor with a span of 10 feet on the Siegwart system has been laid down. The Siegwart fireproof floor consists of hollow beams made of granite concrete reinforced with steel rods. The beams have a uniform width of 10 inches and are of varying depth and span. The beams are sent out from the works ready for immediate use on the job, where they are laid side by side without centering and grouted with cement. The floor surface may then be finished off at once.

On the same Stand as the above are specimens from the various quarries owned by the *Enderby and Stoney Stanton Granite Co., Ltd.* They include worked granite, setts, broken granite for roads, kerbs and channel stones, &c.

*W. & R. Leggott, Ltd.*, have at Stand 39 an interesting display of architectural and builders' ironmongery. Conspicuous among them are the panels showing the arms of the Corporations of Manchester and Bradford. Special attention should, however, be paid to the "Wathol" mortise panic bolt, which has been approved by the L.C.C. and several provincial authorities. The bolts are mortised into the edge of the door and are covered by a metal strip, the only visible parts being the cross rails. They are applicable to single, swing and rebated doors; while the bolts can be operated from the outside by a key only, they are self-locking when the door is closed.

*Messrs. G. Brady & Co.* make a special feature at Stand 48 of a new type of electric service lift in which steel tapes are used for suspending the cage. The tapes wind on a flanged pulley. The gear is found to work very efficiently and to be cheap in first cost; it will raise a load up to 56 lb. Messrs. G. Brady & Co. calculate that the cost of current for a "T" type of lift would be 13*s.* and the cost of maintenance 5*l.* per annum; and they compare this with the 75*l.* a year paid for the labour required to work a busy hand lift all day. The greatly increased first cost of an electric lift over a hand lift is counterbalanced by the amount of work it can do in the same time. The "T" type of lift has been put on the market as fitted for pockets which have hitherto been unable to afford an electric lift. Messrs. Brady show other kinds of lifts, an electric cathead hoist for warehouses, &c., and their revolving shutters.

The *Duroline Wire Wove Roofing Co., Ltd.*, show their unbreakable glazing at Stand 58. "Duroline" is composed of a thick translucent varnish reinforced with a fine wire netting. Its durability led to its adoption at the old Aquarium, Westminster, in place of glass for the roof, which had proved a constant source of expense. Colonel Majendie, Chief Inspector of Explosives, said of the material, "In some respects I consider 'Duroline' preferable to and safer than glass." For ornamental purposes the flexible sheets can be supplied in various colours. The uses to which it may be put are almost without number; they include all those of glass. As a fireproof glazing it would seem to have especial advantages in skylights, for even if intense heat melts the varnish, the wire mesh remains intact.

The *Ruberoid Co., Ltd.*, at Stands 61 and 62 show the wide applicability of the material to roofs of all kinds and for such work as valley gutters, cheeks of dormers, domes, &c. It has now enjoyed a successful career of nineteen years, and during that time has been employed in all parts of the world. Its merits must be familiar to our readers both from actual use and from occasional mention in these columns. Ruberoid roofing gets its greatest praise from those who have employed it.

*Messrs. Machin & Koenig* have erected a half-timbered building at Stand 71 with Eternit slabs for the exterior and interior walls and Eternit tiles covering in the roof. The structure is on similar lines to the new Courts of Criminal Appeal in the London Law Courts, which were likewise built up of a half-timbered frame and Eternit walls and roof. Being composed of asbestos cement the slabs possess great heat and fire-resisting qualities as well as strength and durability. A large number of iron buildings are lined with "E T" slabs as a fire protection, as well as isolation hospitals, schools, doss-houses, shelters and other buildings. There are special "Eternit" asbestos tiles for roofing of an average weight of 21 lb. per square yard, as against about 140 lb. for red tiles, while their tensile strength and crushing strength is 5,781 lb. and 8,281 lb. per square inch respectively.

The *Clee Hill Granite Co., Ltd.*, Ludlow, exhibit at Stands 75 and 76 the different materials supplied to a very large number of county and local authorities from their quarries, comprising setts, macadam, and rough stone for breaking and chippings for footpaths, binding, concrete drives, &c. No better testimonial could be wished for than the following from Mr. R. Phillips, A.M.I.C.E., consulting county surveyor, of Gloucestershire:—"I have tried your stone against six of the hardest and best known road stones, and in every case Clee Hill stone has proved the best."

*W. B. Haigh & Co., Ltd.*, Oldham, at Stand 7, show four of their wood-working machines for different purposes, viz., bandsawing, four-side planing and moulding, tenoning, mortising and boring. The firm hope that interested visitors will journey to their Oldham works, which are only seven miles distant, and inspect the two hundred odd types of machines for sawing and woodworking.

*F. W. Bromley*, Urmston, exhibits at Stand 27 contractors' plant of various kinds, including a number of builders' hoists, hand and motor driven, belting, and a single-cylinder friction steam winch.

*Messrs. J. Dugdill & Co.*, Failsworth, make a good display at Stand 41 of their patent movable fittings and accessories for gas and electric light. In the various extensible switch pendants no counterweights or wall switches are required, so that the effect is extremely neat.

The *Diamond Tread Company, Ltd.*, show at Stand 46 their non-slip stair treads and tiles, which are familiar from general use all over the country.

The *Fawcett Construction Company, Ltd.*, have laid at Stands 87 and 88 their Mon' Lithcrete fire-resisting floor, which carries a load of 18 tons, and shows a deflection of only 1¼ inch. The floor consists of pierced steel girders (from which the web metal has been sheared and the top flanges reduced in width) spaced at from 1 foot to 5 feet apart, and set in broken brick or other suitable concrete. Mr. Mark Fawcett, the inventor, guarantees that the strength of the Mon' Lithcrete steel girders in combination with concrete is double that of joists of equal weight. A tension bond between the girders is obtained by passing twisted hoop steel through the web openings. The system has proved extremely successful and the Fawcett Construction Company have now patented it in the principal countries of the world. The stand also includes the "Edwardian down-draught preventing chimney pot," which is to be seen on Windsor Castle as well as on many a small cottage.

The *Aerograph Co., Ltd.*, must now rely with confidence on being able to attract a crowd of visitors to their stand—which at Manchester is No. 70. The Aerograph spray-painting apparatus is made in sizes to suit all classes of work, from the villa to the largest gasometer or bridge; it is also adapted for all kinds of stencil and shading work on any surface or material. The outfit consists of the handpiece, i.e., the Aerograph, an air compressor, a paint pot and tubes; there are also motor outfits for petrol and electric power. The company have adapted the same principle to a white-washing machine.

The *Check Fire Door Co.*, at Stand 66, show fireproof doors and cupboards constructed on their system, which have come through the tests of the British Fire Prevention Committee with conspicuously successful results, and are now accepted by all insurance companies. The door consists of a thin sheet-iron cover plate on one side, and a perforated iron plate on the inside, between which is a filling of asbestos composition and slate. There are angle irons and a cover strip. Their resistance to fire was a record for single doors, although the total thickness was only one inch.

The *Christie Patent Stone Co.* display at Stand 84 a four-light bow window rebated to take square glass. The company manufacture high-class architectural stonework, and show a few examples on the stand, as well as a collection of photographs of the carved work at St. Thomas's Church, St. Helens, where they executed all the interior arches to nave, aisles and chancel, as well as the door heads and sills.

The *Patent Rapid Scaffold Tie Co., Ltd.*, have at Stand 42 the "scaffixer" tie, which has come to put an end to the scaffold ropes and cords. This valuable patent consists of an iron "scaffixer" block, which is driven into the horizontal pole; two chains are then attached to the hook plate and carried one under and the other over the horizontal and round the vertical pole, and finally linked to the hook plate. The block is then screwed with a spanner as tightly as possible into the horizontal pole. The block can be fixed in one minute and with the greatest ease by any labourer; no wedges are needed to render the tie of the utmost rigidity. Contractors who have hitherto had to do the best they could with cords should welcome the "scaffixer" tie, which is equally applicable to any tie that can be made with the customary cords.

The *Fernden Fencing Co.* have samples of a Fernden cleft chestnut pale fence and gate fence, as well as tree-guards, &c.

The *Yorkshire and Lincolnshire Tar Distillation Co., Ltd.*, have met with the utmost success in the sale of their wood preservative "Kreenol," which is being increasingly specified by architects for both interior and exterior timber work. As well as acting as an effectual preservative against dry-rot, decay and vermin, it stains the wood right through in a pleasant brown shade. One gallon of Kreenol covers about 400 square feet of well seasoned hard wood. It is sold in drums from 1-gallon size to barrels containing 40 gallons or over.

*Messrs. Cookson & Co., Ltd.*, Newcastle-on-Tyne, one of the largest firms of white lead manufacturers in the world, arranged to hold at Stand 49 a series of tests on their Crescent brand of white lead. They claim that it will go much further than any other white lead, and possesses a more consistent density. The stand indicates the wide ground covered by Messrs. Cookson & Co., for it includes several varieties of lead, pipes, &c.

The *Metal Jointing Co., Ltd.*, demonstrate at Stand 50 their entirely new system of jointing between lead and lead, or brass and lead. In a recent issue we described their process, and so there is no need to go into the details again. The company have made a special effort to display the advantages of "Amalgaline."

Cambell's patent combined bath and sink "The Cottager," of which the sole makers are *Messrs. Baxendale & Co.*, Manchester, is to be seen at Stand 68. The bath is of cast iron, and has a glazed ware sink resting across the foot. When the bath is required for use the sink is turned round so as to allow the hot and cold water to enter the bath. The sink has an independent waste pipe.

*Messrs. Kirchner & Co.* contribute several of their joinery machines, which are fitted with the latest labour-saving devices.

Amongst the other exhibitors are C. E. MacCarthy & Co.; Wilson's, Ltd.; the Van Kannel Revolving Door Co., Ltd.; the Reason Manufacturing Co., Ltd.; the Manchester Tenants, Ltd. (half-size model of two cottages as erected in Garden City, Levenshulme); J. Sagar & Co., Ltd.; F. McNeill & Co.; the "Plastoment" Asbestos Flooring Co., Ltd.; Shannon, Ltd.; Edward Leigh (safety ladder brackets); Frazzi Fireproof Construction, Ltd.; H. C. Cleaver, Ltd.; Sanitaries, Ltd.

## THE ART OF THE PLASTERER.

A lecture under the above title was given by Mr. George P. Bankart on the 23rd ult. at Carpenters' Hall, and it was remarkable for its practical nature. At the outset Mr. Bankart explained that his special purpose was to interest and instruct the young plasterers of to-day; and in order to do this he showed how very much the design and technical qualities of plaster work had been and is being influenced by the nature of the materials. "Stucco-duro" was used as far back as 3500 B.C.; under the ancient Romans it became a most valuable adjunct to decoration, and was revived once more at the Renaissance. It was then introduced into England by itinerant Italians; but the difficulty of obtaining the constituents caused the native craftsmen to adapt the new methods to their own "parge" plaster, composed of very old lime, sharp sand, powdered tiles, road scrapings, cowdung, and oxhair. Whereas "stucco-duro" could be modelled to any degree of fineness, spareness or depth of undercutting, "pargetting" was never undercut, but was softly defined and bevelled-edged. The former process was re-introduced by Inigo Jones and Wren, and enjoyed a short career of gradually declining merit until, under the guidance of the Brothers Adam, it burst into a last flame before flickering out. Then came a black interval, when the pseudo-Classic horrors of so-called stucco, not "stucco-duro," were erected in our cities and towns.

When he had thus briefly traced the history of the art, Mr. Bankart dealt at some length with the present-day position of plaster work in the following interesting manner:—

First consider our present-day plaster materials. We have plaster of Paris, Keene's cement, Parian cement, Portland cement, and others. The three former are excellent for interior decoration, and the latter for exterior decoration, if properly understood and naturally used. There is also the ordinary grit plaster with which we generally coat walls and ceilings, and which, I regret to say, is seldom what it should be. This is mainly due to the newness and insufficient slaking of the lime, a bad habit born of the hurry and impatience of the age. Architects should insist in their specifications on the lengthy storage and slaking of lime for plastering; the remedy is quite in their hands.

With reference to these modern materials, the principles and methods of doing the old decorative work apply equally much to them. "Stucco-duro" we have not available now. This is a great misfortune, particularly as the kind of modelling for which this material alone, of all plasters, is so admirably fitted is still increasingly in demand, and is, unfortunately, attempted in plaster of Paris (a soft plaster), absolutely incapable to any degree of producing the technically and artistically fine qualities readily produceable in "stucco-duro." Not only is plaster of Paris unsuitable and incapable, by reason of its softness for this kind of work, but the process of production by gelly casting is also inadequate. The difference between the nature and the quality of the two materials and of the two processes is great, and must be obvious to anyone with eyes and any sense of judgment. If spirited high relief modelling of the old quality, with thin leaves, detached flowers, and isolated stem work, fine crisp detail, and deep shadows, &c., &c., is to be done again, builders and plasterers will have to be persuaded and encouraged (*i.e.*, compelled) to "put down" well burnt lime and to keep it slaked and stored for years, instead of days and weeks as now. In Northern Italy this is done at the present day, thousands of tenements having their lime-pit storage of fifteen, twenty, and thirty years maturity. Architects and public alike want and ask for this class of work, but it can never be done properly or become a great and worthy art again until the proper material of "stucco-duro" is forthcoming. You cannot possibly, by any process, get out of any material technical qualities that it does not possess. This point of the misuse of material is conveniently and wilfully misunderstood and evaded by many architects, who are content to deceive themselves and their clients that they are getting a certain style for convenience called "Georgian." Let me make myself quite clear. "Plaster of Paris" (sulphate of lime) is a very soft and somewhat dull plaster; it is easily damaged; it will not take a thin sharp edge. To show its qualities to advantage it therefore requires a "low relief" (or moderately "low relief") kind of modelling, with no sharp, knife-like edges which will not reproduce, cast, or "draw" from a mould of plaster, or gelly, with quite ordinary care. It is capable of most excellent and beautiful decorative results, treated with moderate flatness of relief, but it must have a mellow and soft definition. On the other hand, "stucco-duro," or carbonate of lime—*i.e.*, well burnt and very old slaked lime, fine sand, and sharp fine grit, or marble dust—was a very smooth "butter-like" plaster when moist, but it set as hard as flint, would take a clean, sharp edge, and could be worked as thin as a rose petal without fear of being easily damaged. It was pure and legitimate modelling. I have heard it called "carving." It was not carving. The "imitation" of it means carving. The substitution of the soft plaster to do the work of a hard one is but a poor makeshift. Something will have to be done to remedy this shortcoming by a little understanding and arrangement between the architect and builder, or their respective societies. It could and would, with time, be easily remedied and supplied "on demand." Until then the best substitution for this kind of undercut work (so far as I know) is in the modelling and casting in plaster of Paris or Keene's cement of the flowers, fruit, &c., individually and separately; and in the fitting of them together afterwards, bedding them into a hollow ground work prepared to receive them. This, of course, requires the judgment of an artist as well as the skill of a "mechanic." Plasterers must sooner or later cultivate the artistic judgment which is inseparable from the craft of the plasterer. Many persons think good modern plaster work is a forlorn hope, or do not give it a thought at all. They are under a delusion with regard to plaster work, for good interesting modern decorative plaster work is being done by modern journeymen plasterers, with conveniently obtainable modern plasters and on thoroughly sound, "artistic," and technical principles. One of the first methods that naturally suggests itself is in the "running" of simple flat members, or rounded "bead-like" mouldings on walls, beams or ceilings in ordinary lime and sand plaster, without "gauging," between which short repeating lengths of simple flat modelling, solid cast, are inserted and stuck in, the joints being neatly filled in and softened off. This is plaster work pure and simple, assuming that the design and modelling are all right.

Then there is the process of modelling and casting individual flowers, leaves, fruit, &c., in low relief, in "plaster of Paris." Draw in the design on the ceiling or on the wall itself, and, after cutting away the "skimming" coat, stick the castings up and model the stem work in between on the ceiling. Stem work having any body of stuff should be built up first with ordinary lime-and-sand plaster with "tow," and the surface afterwards modelled with "lime putty" and "plaster of Paris," or with Keene's cement.

Another nice, clean, and "crisp" process is that of drawing out one's design on a finishing coat of Keene's or similar cement, modelling the stems, flowers, and leafage direct. Work on just so much space only at a time as can be kept damp and in working condition for the day, or some of the modelling may drop off. In doing this it is helpful and expeditious to make a few plaster or cement dies of various sizes. Much time and superfluous labour can then be saved by putting-on, where required, four or five roughly-shaped dabs or pats of moist cement, striking them with the plaster die, which can be held up in place with sticks from the scaffolding until the cement is sufficiently set to remove the die, then clean off and "make good" the surface, &c. There is the similar method of working Portland cement for exterior decorative work, either by part-casting in pure Portland cement or in pressing Portland cement and sand into a clean "plaster of Paris" mould, bedding the casts into the wall where required, and modelling the stem work in cement, in situ, with a small steel tool or trowel.

If one is modelling a vine or rose treatment, it is always helpful to have a length of the old vine or bramble stem on the scaffolding by way of guidance and inspiration. This is also a genuine plaster process.

Then there is the modern process of working in "fibrous plaster"—viz., "plaster of Paris," wood, and coarse canvas —cast in strips or slabs from plaster or gelly moulds, and fixing it up with brass screws or nails, copper wire, or canvas "wadding" to the timber, iron, or "expanded metal" construction of the building. This process is due to the development of the iron, steel, and concrete construction. It has come to stay, whether we consider it genuine plaster work or not. Its extensive employment is purely a matter of convenience, and even of necessity, but the process is capable of excellent decorative treatment (properly developed) and of expeditious manufacture and affixation in the hands of the skilled mechanic.

Success in all these processes lies very largely in knowing and developing to the full (without abuse) the natural decorative capabilities of the material one has to work in, whether it be "stucco-duro," lime and sand plaster, "plaster of Paris," Keene's, Parian, Portland, or any other cement.

Something else is needed.

Now, I want a few words with the younger generation of plasterers, to whom one must look for the future resuscitation of the plasterer's "art," which I fully believe will thrive again sooner or later. I want to appeal in particular, if I can, to the inner nature and intelligence of the apprentice, of the improver, and of the "journeyman" plasterer, who has some interest in his work beyond the day's drudgery and the week end. As a mechanic he is excellent; as a plasterer he is too excellent; that is too mechanical. He carries his work, mechanically, too far to be an artist. He often unconsciously wipes out of his work, whilst doing it, artistic qualities by mere force of habit; beautiful qualities of surface, which he has been trained to regard as indifferent workmanship, because it is not perfectly smooth and polished. If the plasterers of Queen Elizabeth's time had had the mechanical instinct of the present day, some of their work might have been perhaps still more interesting than it is. There is any amount of intelligent interest and artistic ability lying dormant in the plasterer's trade at the present day, if it can only be roused and cultivated and encouraged. In my opinion there is nothing to stop a healthy revival of the plasterer's art if the juniors and younger adult members of the trade will only rise to the occasion, try to cultivate the decorative element conjointly with the mechanical side, and once realise the great difference and increased interest it would give to their daily work in the way of relief from continuous mechanical drudgery.

Some of you may say to yourselves, as I did, "How am I to begin?" "Where am I to begin?" Begin by looking at the old work, by examining it, by analysing it, by trying to do something like it, until "ideas" come to you from doing so. Then try to work them out. Notice in the old decorative plaster work that, with the exception of one type, it was mostly the flat treatment of flat surfaces. Notice the simple flat saucer-like leaves, with bevelled edges, and the bossy flowers. Notice the simple stem work, waved or bent into varying forms of "rhythm," enclosing simply arranged sprays that grow quaintly from it. Notice the softness of the low relief "plaster of Paris" modelling, and the crispness, brilliancy and vigour of the higher relief "stucco-duro" modelling. The modern plaster modeller, as a rule, has much to unlearn, because he models without plastering; he will not trouble to look at and learn from the old work, and he forgets his material and he will not be "simple." He likes restlessness and undulation of surface, and a "plenty-for-your-money" sort of look about his work; "sparkle" I think they call it. The fault is not altogether his own. He is often the slave of the public. Notice the softness, the roundness, or the flatness and the simple grouping of the old plaster mouldings, as well as the scale of them. They did not resemble wood, stone, or marble mouldings, with sharp edges. Notice how some of the old plaster decoration took inspiration from the tapestry and needlework of the period in which it was done. Notice how the flowers and leaves were set mostly flat, or in profile, on not too level or smooth a background with little or no foreshortening, and that perspective (in this flat plaster decoration) is conspicuous by its absence. A lot of modern decoration is putrid because it attempts to combine naturalistic representation and perspective in a decorative setting. It is absurd. The old plasterers went to nature for their inspiration, and absorbed just so much of her as was helpful to their purpose and expressible in their material in a simple way and limited degree; but they stopped short at imitation and mimicry. Bunches of grapes were sometimes round in shape, sometimes oval, or pointed at one end and round at the other, made up of rings of flat berries. The same kind of interpretation or "convention" applies to the vine leaf, with its pentagon outline, irregular edges, central loopings, and radiating veinings; and to the rose, its leaf, and all other forms. They were not copies of, or like, grapes, vine leaves, roses, &c., but all the same they were unmistakably grapes, vine leaves, roses, &c.; you could not call them anything else—that is to say, they were decoratively shaped and arranged harmoniously, poetically, musically—call it what you will.

You will find plenty of restraint and reserve, generally, throughout the old work. Seldom does it look strained, overcrowded, affected, or pettifogging in scale. It became natural and easy to them, because the work was done straightforwardly, and at the building. They moved about from job to job taking their moulds and models with them, and earned 6*d*. and 10*d*. a day then against 1*s*. an hour now! Pick out and learn all you can in this way from the good old work, and try to do good work of your own. Learn from the simplest and purest of what was done in the past (when your trade was a great art), watch what living men have done and are doing still with your own material, as a means of real "decorative" expression. Find out for yourselves the beautiful qualities that are possible to your material, and try to get into your own work some of the spirit of the old stuff, until you can do better! It must come as a pleasure, to do it well, and also as a hobby as well as a trade. Train yourselves to feel and to realise something of "scale," contrast of light and shade, line, and form, and even then you may not be able to do it for some time! The rest, the instinct, depends on Nature's endowment, and the will-power, the concentration, and the intelligence you personally bring to bear in developing your art and yourself at the same time, for art is human, and depends on the degree of your humanity. It must be acquired, and then cultivated and developed. Try to do simple things well, first, and you will generally stick to them, for simple things are more difficult to do well than elaborate rubbish. The rest will come of itself, gradually.

## TRADE NOTE.

Messrs. Joseph Kaye & Sons, Ltd., Leeds, proprietors of Kaye's patent seamless serrated oil cans, with Kaye's patent seamless spouts, have just received further orders from the British Navy for 3,918 oil cans and 6,963 seamless spouts for His Majesty's *Dreadnoughts*.

A training college for teachers is to be erected in Dundee by the Board of Education. The local education authority are negotiating for a site. It is expected the outlay will be about 40,000*l*.

The Winter Gardens, New Brighton, are to be altered at a cost of about 4,000*l*. The theatre will be enlarged so as to accommodate 1,350 people instead of 900, as at present. The plans have been approved by the various local authorities.

The Ballachulish Slate Quarries, N.B., will shortly be worked by electricity. The preliminary foundations for the haulage and pumping machinery have been commenced. It is believed to be the first instance in Scotland of introducing electric power into a slate quarry.

THE

# Architect and Contract Reporter.

FRIDAY, MARCH 18, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 COLMORE ROW.

*** *Entered in the United States of America as second-class matter.*

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## NOTICE TO ADVERTISERS.

**Under no circumstances whatever can the Proprietors of this journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## NOTICE.

*Next Friday being Good Friday,* THE ARCHITECT *will be published on Thursday. All advertisements intended for this Number must reach the Office not later than* 4 P.M. *on Wednesday, March* 23.

*No alteration of advertisement copy can be allowed after Saturday morning, March* 19.

## COMPETITIONS OPEN.

IRELAND.—April 23.—The Meath County Council invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Apply to Mr. H. J. Cullen, Meath County Council Offices, Navan.

LIVERPOOL.—The Corporation invite designs from architects practising in Liverpool for a branch library estimated to cost not more than 7,000*l*. Mr. W. E. Willink, F.R.I.B.A., will act as assessor. Apply to Mr. E. R. Pickmere, town clerk, Reference Library, William Brown Street, Liverpool.

LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

SCOTLAND.—March 21.—The Renfrew Parish Council invite plans and estimates for offices to be erected at Blawarthill, Yorker Road, near Scotstoun West Station. Deposit 10*s*. No premium. The Clerk to the Council, 1 Manse Street, Renfrew.

SHEFFIELD.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Will be returned to those who send plans to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

WALSALL.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

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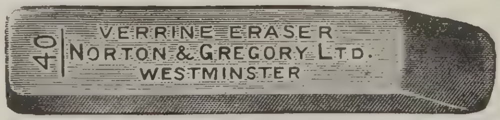

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## CONTRACTS OPEN.

Ashburton.—March 31.—For an addition to the Ashburton and Buckfastleigh Cottage Hospital. Mr. H. Mallaby Firth, hon. secretary, Ashburton, Devon.

Aston.—April 1.—For drainage work and new conveniences (builder, joiner and plumber) at the Aston Provided school. Deposit 1*l.* with the West Riding Treasurer, County Hall, Wakefield. Apply to the Education Architect, County Hall, Wakefield.

Annfield Plain.—March 22.—For the several works required in erection and completion of warehouse, &c., at Annfield Plain, Durham. Mr. T. H. Murray, architect and surveyor, Consett.

Barnwood.—March 24.—For erection of a general bathhouse on the female side of the second county asylum at Barnwood, near Gloucester. Deposit 1*l.* 1*s.* The Clerk of the Works, Wotton Asylum, Gloucester. Messrs. Giles, Gough & Trollope, architects, 28 Craven Street, Charing Cross, London, W.C.

Barrow-in-Furness.—March 26.—For alterations and additions to Piel View, Public Park. The Borough Engineer's Office, Town Hall, Barrow-in-Furness.

Birkenhead.—March 22.—For alterations and additions to the master's office and nurses' home; also for the erection of a committee room at the Workhouse. Deposit 5*l.* 5*s.* Messrs. Edmund Kirby & Sons, architects, 5 Cook Street, Liverpool.

Birmingham.—April 5.—For alterations to Birmingham head post-office. H.M. Office of Works, Birmingham.

Bugle.—April 3.—For erection of concrete chapel at Bugle, Cornwall. Rev. J. T. Morris, Sunny Bank, Mount Charles, St. Austell.

Burghill.—March 24.—For erection of an isolation hospital and other contingent works at Burghill, Hereford. Deposit 1*l.* 1*s.* The County Surveyor, Shirehall, Hereford.

Cirencester.—April 2.—For the demolition of buildings adjoining the police station, and construction of a new superintendent's house upon the site. Deposit 2*l.* Mr. E. S. Sinnott, M.I.C.E., county surveyor, Shirehall, Gloucester.

Clayton West.—March 24.—For erection of a shed at Clayton West, Yorks. Send names to Messrs. Samuel Jackson & Son, architects, 11 Tanfield Chambers, Bradford.

Cleator Moor.—For the different artificers' work in connection with erection of a residence at Cleator Moor, Cumberland. Forward names to Mr. Ernest Martindale, architect and surveyor, 11 Lowther Street, Whitehaven.

Delph.—March 31.—For the provision of two folding partitions at Delph Council school, for the West Riding County Council. Mr. Edgar T. Woodhead, divisional clerk, Huddersfield.

Dronfield.—For erection of two cottages at Dronfield, Yorks. Mr. S. L. Chipling, architect, 37 Orchard Street, Sheffield.

Eccles.—March 21.—For erection and completion of extension to the electricity station, Cawdor Street, Patricroft. Deposit 10*s.* 6*d.* Mr. N. Hartley Hacking, 50 Blackfriars, Manchester.

Egremont.—For the different artificers' work in connection with the additions and alterations to 11 Main Street, Egremont, Cumberland. Mr. Ernest Martindale, 11 Lowther Street, Whitehaven.

Ferryhill.—March 21.—For erection of an inspector's house near Ferryhill Station, with outbuildings and storehouse, for the Weardale and Consett Water Company. Mr. Askwith, M.I.C.E., resident engineer, South Road, Bishop Auckland, and at the Company's office, North Road, Durham.

Gateshead.—March 31.—For erection of the Brighton Avenue new school. Deposit 1*l.* 1*s* Mr. F. W. Purser, architect, West Street, Gateshead.

Glasgow.—March 21.—For (1) structural steel work, (2) builder's work in connection with the provision of a new roof, Glasgow Cathedral, for the Commissioners of His Majesty's Works and Public Buildings. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow (Hanover Street entrance).

Glasgow.—March 21.—For the adaptation of premises, 31 Prince Edward Street, Glasgow, for the purposes of a telephone exchange, for the Commissioners of H.M. Works and Public Buildings. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow.

Glasgow.—March 26.—For the following works required for the new Mitchell Library, viz.:—(1) Marble, rubber, and tile works; and (2) painter work. Deposit 2*l.* 2*s.* The Office of Public Works, 64 Cochrane Street.

Glendurgan.—March 22.—For building two cottages at Glendurgan, Cornwall. Mr. George Henry Fox, Wodehouse Place, Falmouth.

Halifax.—March 23.—For the various works required in connection with additions to Bradshaw Mills, near Halifax, Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Halifax.—March 23.—For erection and construction of retaining walls and roadways and alterations to existing buildings in Charlestown Road. Deposit 5*l.* Mr. James Lord, M.I.C.E., borough engineer, Town Hall, Halifax.

Halifax.—March 31.—For the various works required in connection with alterations to residence, Savile Park. Messrs. Clement Williams & Sons, architects, &c., Post Office Buildings, Commercial Street, Halifax.

Haslingden (Lancs).—March 21.—For the whole of the work required in erection of a farm house adjoining the present Union farm buildings, for the Guardians. Deposit 1*l.* 1*s.* Mr. A. Brocklehurst, architect, St. James's Chambers, Waterfoot.

Hayes.—March 29.—For erection and completion of St. Mary's Parish Room. Deposit 1*l.* 1*s.* Apply to Fairfield, High Road, Hayes, Middlesex.

High Spen and Leadgate.—March 31.—For alterations and improvements to 38 cottages at High Spen, 10 cottages at Derwent Cottages, and 4 cottages at Leadgate, co. Durham, for the Consett Iron Co., Ltd. Mr. Chas. E. Oliver, architect, company's general offices, Consett.

Ireland.—March 21.—For erection of residence at Abbeylands, Navan. Deposit 1*l.* 1*s.* Mr. R. Barnes, Tatestown, Navan.

Ireland.—March 21.—For the re-building of the Guildhall, Londonderry, for the Corporation. The City Architect, Municipal Offices, Foyle Street, Londonderry.

Ireland.—March 23.—For building and completing parochial residence at Culdaff, county Donegal. Mr. J. P. M'Grath, C.E., architect, 6 Castle Street, Londonderry.

Ireland.—March 30.—For the erection of a public library at Ballyboden, Rathfarnham, for the South Dublin Rural District Council. Mr. T. J. Byrne, A.R.I.B.A., architect, 1 James's Street, Dublin.

Kendal.—March 24.—For whole or separate trades in new chancel, organ chamber, and vestries at St. George's Church. Messrs. Austin & Paley, architects, Lancaster.

Kendal.—March 23.—For alterations to 18a Finkle Street. Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

Leicester.—March 21.—For erection of new buildings and alterations at the Town Museum, New Walk. Deposit 1*l.* 1*s.* Messrs. Tait & Herbert, architects, 18 Friar Lane, Leicester.

Lincoln.—April 11.—For the construction of a brick and stone tower, 108 feet high to T.W.L., to support a spherical bottomed steel tank, containing over 300,000 gallons of water, and subsidiary works at Westgate, Lincoln, for the Corporation. Deposit 5*l.* 5*s.* with the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

Liverpool.—March 21.—For alterations and additions to the Workhouse, Smithdown Road. Deposit 3*l.* 3*s.* Send in names by March 21 to Mr. Walter W. Thomas, M.S.A., architect and surveyor, 15 Lord Street, Liverpool.

Liverpool.—March 30.—For the construction of an open-air bath in Queen's Drive, Walton. Deposit 1*l.* 1*s.* Mr. W. R. Court, engineer, Municipal Offices, Liverpool.

London.—March 31.—For repairs to and reglazing of the roof of the reading-room, for the Wimbledon Public Library committee. Mr. Henry Wm. Bull, librarian, Public Library, Wimbledon, S.W.

London.—April 7.—For the reconstruction of part of drainage and alterations to and addition of new w.c.'s on the women's side of Newington Workhouse, Westmoreland Road, Walworth, S.E. Deposit 2*l.* 2*s.* Mr. A. W. Tribe, architect, 120 Clapham Road, S.W.

Lowestoft.—For erection of a boarding house on the Esplanade. Mr. R. Scott Cockrill, A.R.I.B.A., Crossley House, London Road, Lowestoft.

Manchester.—March 23.—For additions and alterations to the present boiler-house at the Workhouse at Crumpsall. Deposit 10*s.* 6*d.* Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

Maryport.—March 21.—For the various artificers' work required in connection with the Central Hall. Mr. J. N. Singleton, architect, 61 Lowther Street, Whitehaven.

Perth (Scotland).—April 2.—For the works to be executed in repair and re-construction of the roofing on the west side of Perth general station. The contract comprises steel and iron work, carpenter and joiner work, slater work, glazier work, plumber work, and painter work, for the Perth

General Station Joint Committee. Deposit 2*l*. 2*s*. The Engineer-in-Chief of the Caledonian Railway, Buchanan Street Station, Glasgow.

Portsmouth.—March 21.—For the erection of a temporary corrugated iron building in the playground of the Stamshaw boys' school. Mr. A. H. Bone, surveyor, Cambridge Junction, Portsmouth.

Ramsgate.—March 30.—For erection of a new elementary infants' school in Lillian Road. Deposit 2*l*. 2*s*. Mr. W. T. Stock, architect, at the office of Messrs. Hinds & Sons, architects, 57 Queen Street, Ramsgate.

Richmond (Surrey).—March 22.—For the construction of a pump chamber to be fixed in the Petersham Well, Petersham Meadow. Deposit 1*l*. 1*s*. Mr. W. G. Peirce, engineer, Water Works Office, Riverside, Richmond.

Scotland.—For brickwork, steelwork, and iron windows for erection of extension to Whitehall Works, Dundee. Messrs. H. & F. Thompson, architects, Castle Street, Dundee.

Scotland.—March 21.—For mason, carpenter, slater, painter and glazier work of proposed Baptist Church, Buckie. Mr. George Macpherson, architect, Buckie.

Scotland.—March 23.—For brick, joiner, plumber, plaster and tile works of proposed golf pavilion, Cowdenbeath. Mr. D. B. Campbell, architect, Cowdenbeath.

Scotland.—March 23.—For brick, joiner, plaster, slater and plumber work in alterations and additions to the Cowdenbeath Library Society's premises in High Street. Mr. William Stewart, 58 Stenhouse Street, Cowdenbeath.

Shrewsbury.—March 21.—For erection of stables and depôt at Roushill, for the Corporation. Deposit 2*l*. 2*s*. Forward names to Mr. Arthur E. Williams, architect and surveyor, County Chambers, 12 High Street, Shrewsbury.

St. Helens.—March 21.—For erection of a school in North Road. Deposit 1*l*. 1*s*. Mr. Frank S. Biram, architect, George Street, St. Helens, Lancs.

St. Helens (Lancs.).—March 22.—For erection of a laundry, &c., at the borough sanatorium. Deposit 1*l*. 1*s*. Mr. Geo. J. C. Broom, M.I.C.E., borough engineer, Town Hall, St. Helens.

Sturminster Marshall.—March 24.—For building an elementary school at Sturminster Marshall, Dorset. The County Surveyor, Wimborne.

Sunderland.—March 22.—For erection of a nave and aisle of the new church of St. Aidan, Grangetown. St. Aidan's Mission Room, Grangetown.

Tinsley.—March 25.—For the following works for the Parish Council:—(1) Constructing a fence wall, and (2) wrought iron railings and gates for enclosing the recreation ground. Mr. J. L. Winkley, clerk, 15 Harrowden Road, Tinsley, Sheffield.

Wales.—For taking down and rebuilding 94-95 Queen Victoria Street, Tredegar, Mon. Mr. H. Waters, M.S.A., Market Chambers, Ebbw Vale.

Wales.—For pulling down and rebuilding the Britannia Inn, at Llanbadoc, near Usk, Mon. Messrs. Swalwell & Havard, architects and surveyors, 202 Dock Street, Newport, Mon.

Wales.—March 22.—For carrying out the following works, for the Barry local education authority:—(1) Alterations and additions to Holton Road infants' school, Barry. Deposit 2*l*. 2*s*. (2) Plumbing work in connection with such alterations and additions. Deposit 1*l*. 1*s*. Mr. G. A. Birkenhead, architect, 102 St. Mary Street, Cardiff, and St. Nicholas Road, Barry.

Wales.—March 23.—For taking down existing cottages and erecting two houses at Penygarn. Mr. D. C. Udell, architect, Commercial Street, Pontypool.

Wales.—March 23.—For erection of two houses at Porthcawl. Deposit 2*l*. 2*s*. Messrs. Geo. F. Lambert & Son, architects and surveyors, Bridgend.

Wales.—March 25.—For renovations to the Vine Tree Inn, Llanvetherine; also to the Three Salmons Inn, Llantilio Crossenny, near Abergavenny. Mr. B. J. Francis, architect, Abergavenny.

Wales.—March 25.—For taking down existing and erecting two stables, coach-house, boundary walls, &c., at White House, Little Mill, near Pontypool. Mr. D. C. Udell, architect, Commercial Street, Pontypool.

Wales.—March 29.—For erection of 76 or more houses, proposed to be built at Tredegar, Mon. Mr. Wm. Harris, architect and surveyor, Bank Chambers, Bargoed.

Wales.—March 31.—For alterations and additions to Maesydderwen to convert into county schools, for the Governors of the Ystradgynlais County School. Mr. J. Cook Rees, architect, Neath. Sealed tenders to be sent to Mr. B. L. Thomas, clerk to the Governors, Tir Roger, Ystradgynlais, by March 31, endorsed "Tender for schools."

Wales.—April 1.—For erection of cookery-kitchen and class-room at Brynmawr Council school, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Education Committee, County Hall, Brecon.

Wales.—April 5.—For the erection of an infants' school, with offices, &c., at Clarence Street, Mountain Ash. Deposit 2*l*. 2*s*. Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

Wales.—April 7.—For the extension of the Victoria warehouse, Victoria Wharf, North Dock Basin, Swansea, for a distance of 57 feet, with four floors, and erecting two additional floors on the old building. Mr. A. O. Schenk, M.Inst.C.E., Harbour Offices, Swansea.

Wales.—April 21.—For new mixed and infants' school (346 places) and cookery kitchen at Builth Wells, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Waltham.—April 5.—For the execution of alterations and repairs at the Waltham Council school, Kent. Mr. C. J. Wanley Croft, correspondent, Bridge, Canterbury.

Walton-on-Naze.—March 31.—For erection of a public Elementary school. Deposit 3*l*. 3*s*. Send names by March 31 to the architects, Messrs. Tomkins, Homer & Ley, Frinton-on-Sea.

Watford.—March 23.—For supply and erection of a steel and corrugated iron building, size 29 feet by 30 feet by 24 feet high. Mr. D. Waterhouse, engineer to the Council, High Street, Watford.

Watford.—March 23.—For building a pump chamber and engine foundations in brickwork and concrete. Mr. D. Waterhouse, engineer to the Council, High Street, Watford.

Wednesbury.—March 31.—For the erection of public sanitary conveniences (exclusive of sanitary fittings) near the Market Place. Mr. E. Martin Scott, borough engineer and surveyor, Town Hall, Wednesbury.

## TENDERS.

### CHOLSEY.

For the enlargement of the Council school at Cholsey, Berks.

| | | | |
|---|---|---|---|
| Stephens, Bastow & Co. | £1,652 | 0 | 0 |
| Bloxham | 1,531 | 0 | 0 |
| Smallbone & Sons | 1,426 | 10 | 0 |
| Godwin | 1,419 | 0 | 0 |
| Fitt | 1,375 | 0 | 0 |
| Brasher & Sons | 1,315 | 12 | 1 |
| Wheeler | 1,310 | 19 | 8 |
| Bosher & Sons, Cholsey (*recommended*) | 1,308 | 8 | 6 |
| Colborne | 1,288 | 15 | 3 |

### EXETER.

For additions and alterations at St. Luke's College, Heavitree Road. Mr. James Jerman, F.R.I.B.A., Exeter.

| | | | |
|---|---|---|---|
| F. E. Sleeman | £6,357 | 3 | 0 |
| Fursland | 6,350 | 0 | 0 |
| Westcott, Austin & White | 6,151 | 0 | 0 |
| M. T. Sleeman | 5,998 | 11 | 3 |
| Wakeham Bros. | 5,985 | 0 | 0 |
| Pittard & Son | 5,899 | 0 | 0 |
| Mudge | 5,882 | 10 | 0 |
| Stephens & Son | 5,800 | 0 | 0 |
| Yeo & Sons | 5,790 | 0 | 0 |
| Ham & Passmore | 5,695 | 0 | 0 |
| Luscombe & Son | 5,596 | 0 | 0 |
| Brealy | 5,369 | 0 | 0 |
| Bunclark | 5,261 | 0 | 0 |
| Triggs | 5,240 | 0 | 0 |
| Herbert | 5,232 | 9 | 0 |
| Setter & Son, Exeter (*accepted*) | 5,190 | 0 | 0 |

### IBSTOCK.

For enlargement of Council school, for the Leicestershire County Education Committee. Mr. W. M. Cowdell, architect, Leicester.

| | | | |
|---|---|---|---|
| Cole & Sons | £889 | 0 | 0 |
| Harding | 884 | 0 | 0 |
| Bowles & Son | 881 | 0 | 0 |
| Bradford | 837 | 0 | 0 |
| Moss & Son | 827 | 18 | 0 |
| Chapman | 819 | 0 | 0 |
| Haycock | 812 | 0 | 0 |
| Haycock Bros. | 800 | 3 | 0 |
| Wileman & Gange | 793 | 0 | 0 |
| Barker & Sons, Loughborough (*accepted*) | 749 | 0 | 0 |

## GREAT CROSBY.

For making of Myers Road East, for the Urban District Council. Mr. Watkin Hall, A.M.Inst.C.E., surveyor, Great Crosby.

| | | | |
|---|---|---|---|
| Ireland | £3,336 | 3 | 8 |
| Starkey | 3,149 | 4 | 7 |
| Worthington | 3,074 | 12 | 0 |
| Castain & Son | 3,073 | 0 | 0 |
| Tarmac | 3,064 | 14 | 3 |
| Johnson | 3,052 | 0 | 0 |
| Marr & Son | 3,050 | 0 | 0 |
| Smart & Son | 2,934 | 17 | 7 |
| Chadwick | 2,915 | 12 | 3 |
| Owen | 2,906 | 12 | 0 |
| North Wales Asphalte Co. | 2,754 | 0 | 0 |
| Stansbury & Banks | 2,746 | 0 | 0 |
| Balmer | 2,745 | 0 | 0 |
| Gilbertson, Great Crosby (*accepted*) | 2,700 | 0 | 0 |

## GREENWICH.

For the erection of two iron fire-escape staircases at the Greenwich Infirmary. Mr. Louis Jacob, F.S.I., Raymond House, Gray's Inn, W.C.

| | | | |
|---|---|---|---|
| Mackenzie & Moncur | £714 | 13 | 2 |
| Bromsgrove Guild | 689 | 18 | 9 |
| May | 624 | 17 | 1 |
| Bartle & Co. | 573 | 6 | 3 |
| Lift and Hoist Co. | 571 | 11 | 9 |
| Newman & Manning | 567 | 8 | 7 |
| Cadogan Iron Works | 533 | 5 | 6 |
| Kirk & Randall | 520 | 0 | 0 |
| Herring & Son | 512 | 9 | 8 |
| Aston & Sons | 511 | 8 | 6 |
| Norris & Co. | 488 | 0 | 0 |
| Hayward Bros. | 478 | 9 | 9 |
| Hall & Son | 477 | 16 | 4 |
| General Iron Foundry Co. | 473 | 3 | 2 |
| Jones & Co. | 471 | 5 | 5 |
| St. Pancras Iron Co. | 461 | 13 | 9 |
| Pierson & Co. | 429 | 8 | 8 |
| Safety Tread Syndicate Co. | 428 | 16 | 6 |
| Lockerbie & Wilkinson | 423 | 11 | 1 |
| Wenham & Waters, Croydon (*accepted*) | 423 | 0 | 0 |

## HEREFORD.

For the restoration of the north chancel aisle roof of St. Mary's Church.

| | | | |
|---|---|---|---|
| Newton (*accepted*) | £898 | 4 | 7 |

## KEADBY.

For erecting six dwelling-houses at Keadby, Doncaster. Mr. G. Sinclair, architect, Doncaster.

| | | | |
|---|---|---|---|
| Thompson | £949 | 0 | 0 |
| Laughton | 945 | 0 | 0 |
| Stacy | 900 | 0 | 0 |
| Teanby Bros., Doncaster (*accepted*) | 835 | 0 | 0 |

## LEYTON.

For carrying out alterations and additions at the police-station at Lea Bridge Road. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

| | | | |
|---|---|---|---|
| Jarvis & Sons | £1,746 | 0 | 0 |
| Higgs & Hill | 1,694 | 0 | 0 |
| Willmott & Sons | 1,598 | 0 | 0 |
| Todd & Newman | 1,594 | 0 | 0 |
| Harris & Wardrop | 1,592 | 0 | 0 |
| Newby Bros. | 1,591 | 0 | 0 |
| Grover & Son | 1,532 | 0 | 0 |

## LONDON.

For erection of clergy house, choir-rooms, &c., for the rector and churchwardens of St. Anne's Church, Soho. Mr. W. Courtenay Le Maitre, A.R.I.B.A., architect, 63 Finsbury Pavement, E.C.

| | | | |
|---|---|---|---|
| Leslie & Co. | £2,948 | 0 | 0 |
| Bywaters & Sons | 2,895 | 0 | 0 |
| Townsends | 2,779 | 0 | 0 |
| Marsland & Sons | 2,745 | 0 | 0 |
| Staines & Co. (*accepted*) | 2,744 | 0 | 0 |

For additions to house, Pollards Hill, Norbury, S.W. Mr. Douglas Weightman, architect, Croydon.

| | | | |
|---|---|---|---|
| Pitcher & Son | £469 | 0 | 0 |
| Wornham | 439 | 0 | 0 |
| Sanders | 429 | 10 | 0 |
| Everitt | 425 | 0 | 0 |
| Sedgwick | 381 | 0 | 0 |
| Flatman | 336 | 0 | 0 |

## LOWESTOFT.

For reinstatement of premises, 116 London Road. Messrs. Morgan & Buckingham, architects and surveyors, Norwich.

| | | | |
|---|---|---|---|
| Gravelling | £927 | 6 | 6 |
| Earl | 864 | 0 | 0 |
| Swatman | 794 | 17 | 0 |
| Todd | 758 | 10 | 0 |
| Cole | 748 | 0 | 0 |
| Bedwell & Parker | 737 | 0 | 0 |
| Hawes & Sons | 730 | 0 | 0 |
| Yelf | 685 | 0 | 0 |
| Youngs & Sons, Norwich (*accepted*) | 669 | 0 | 0 |

## NORWICH.

For erection of warehouse, St. Stephen's Street. Messrs. Morgan & Buckingham, architects and surveyors, Norwich.

| | | | |
|---|---|---|---|
| Holmes | £751 | 0 | 0 |
| Smith | 699 | 0 | 0 |
| Youngs & Son | 694 | 0 | 0 |
| Gill & Son | 667 | 0 | 0 |
| Hannant, Norwich (*accepted*) | 611 | 0 | 0 |

## ORPINGTON.

For the erection of banking premises, for the London County and Westminster Banking Co., Ltd. Mr. G. St. Pierre Harris, architect, 8 Laurence Pountney Hill, E.C., and Orpington, Kent. Quantities by Messrs. Stoner & Sons, 63 New Broad Street, E.C.

| | | | |
|---|---|---|---|
| Howard | £4,443 | 0 | 0 |
| Durtnell & Son | 4,385 | 0 | 0 |
| Jones & Andrews | 4,222 | 0 | 0 |
| Pearce Bros. | 4,200 | 0 | 0 |
| Graty | 4,149 | 0 | 0 |
| Wiltshire & Son | 4,098 | 0 | 0 |
| Crossley & Son | 4,088 | 0 | 0 |
| Green | 4,079 | 0 | 0 |
| Large | 4,000 | 0 | 0 |
| Arnaud & Son | 3,996 | 0 | 0 |
| Treasure Bros. | 3,850 | 0 | 0 |
| Blay | 3,829 | 0 | 0 |
| Somerford & Son (*accepted*) | 3,757 | 0 | 0 |

## SCOTLAND.

For improvements at the Forfar Infirmary.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Findlay & Co., mason work | £328 | 10 | 0 |
| M'Laren & Sons, plumber work | 282 | 14 | 0 |
| Dall, joiner work | 175 | 7 | 6 |
| Mackenzie & Moncur, copper, piping, &c. | 120 | 0 | 0 |
| Kerr, slater work | 24 | 10 | 0 |
| Troup Bros., plasterer work | 18 | 8 | 3 |

## SOUTH SHIELDS.

For the formation of the forecourt of the Municipal Buildings. Mr. E. E. Fetch, A.R.I.B.A., 20 John Street, Adelphi, W.C.

| | | | |
|---|---|---|---|
| Young (*accepted*) | £3,755 | 0 | 0 |

## WALES.

For the extension of the Queen Street Infants' School, Abertillery. Mr. W. H. Hiley, architect, Abertillery.

| | | | |
|---|---|---|---|
| Jones | £2,282 | 0 | 0 |
| Davies & Sons | 2,156 | 0 | 0 |
| Tudor, Abertillery (*accepted*) | 2,090 | 0 | 0 |
| Colborne | 1,899 | 10 | 0 |

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The Stone Carvers' Trade Association recently presented a memorial to the various Associations and Institutes of Architects in Great Britain. The memorialists deplored the low standard of work generally prevailing, and pointed out that it was the result of the men being compelled to leave work in an unfinished condition. The evil of scamping, they averred, was often caused by the work being sub-contracted, or being let to the lowest tenderer irrespective of its quality. It was held that the remedy was entirely in the architect's power, for he had only to refuse to pass scamped work, and it would cease. Whilst not venturing to criticise design, the Association pointed out that most old work was admittedly superior, because it was properly executed—the outline being good, the shadows sharp, and a proper play of light and shade. The Association has received favourable replies from most of the institutes and associations to whom the memorial was sent, expressing sympathy with its aim.

## PORTMADOC SLATES.

In a previous article (*Architect*, September 24, 1909) it was shown that the only slates entitled to the name "Portmadoc," and the guarantee of quality this name carries with it, were those produced in the Festiniog district of North Wales, and also that all the quarries of importance producing such slates were included among the members of the Festiniog District Quarry Proprietors' Association. A list of the names of these quarries was given, and the various slate veins of the district which are worked by them were briefly described.

It is the intention of the present article to deal, as then promised, with the characteristics of these various slate veins, and more particularly with those of the slates produced from each of them.

*Old Vein.*—In discussing Portmadoc slates from this point of view it is but natural to deal with the Old Vein first. Not only is this the vein that produces the finest quality of slates in the district, but it is also the most extensively worked. "Old Vein" and "Portmadoc" are terms whose conjunctivity is more than familiar in the slate trade, not only in this country, but wherever slates are used the world over, and while the slates from other veins in the district are without exception of excellent quality, "Old Vein" slates remain the Portmadoc slate par excellence. The best slates from this vein, which are so well known as "Best Old Vein," can challenge comparison with any produced elsewhere, and it is not going too far to say that it is to the "Old Vein" product that Portmadoc owes the larger portion of its fame as a slate-producing district.

In describing a slate it is somewhat difficult to name features which markedly distinguish it from others which in general appearance may bear a resemblance to it. This is perhaps particularly the case with Portmadoc slates, since their colour is one that does not differ greatly from that of slates produced in several other places, both at home and abroad.

Great strength and durability are features that are common to the "Old Vein" and all other Portmadoc slates. Their durability means not only ability to withstand the ordinary atmospheric influences under constant exposure on a roof, but also to last practically indefinitely under the severe conditions imposed by the acid-charged atmosphere of our great towns. The thousands of roofs throughout this country and abroad that have been roofed with Portmadoc slates for periods of fifty years and upwards are conclusive evidence on this point. It is these inherent, rather than apparent, qualities of strength and durability that most distinguish genuine Portmadoc slates from many others.

To return to the "Old Vein," however, the colour, as is generally known, is a blue grey, and this colour, as a general description, is again common to all Portmadoc slates. Though the colour of the slates from all the veins shows but little difference, "Old Vein" slates are more blue and less grey than any others. They probably show a truer blue than any other slate on the market. Let it here be said that no Portmadoc slates are in the least black in hue. This is worth remembering, as there are certain inferior qualities of slates, which quickly perish, that are sometimes offered as "Portmadocs" and which have a decided blackish appearance. The surface of an "Old Vein" slate is dull, never shiny, but very close-grained and fine looking.

The quarries at the present time working in the Old Vein are the Oakeley, Messrs. J. W. Greaves & Sons, the Maen Offeren, the Votty and Bowydd, New Rhosydd, Diphwys Casson, Park and Croesor, and Glanrafon.

QUARRYING "OLD VEIN" SLATE IN OPEN, FESTINIOG.

Among other important buildings, the new Palace of Peace at The Hague is at the present time being roofed with best Old Vein slates from the Oakeley quarries.

*The New Vein.*—The New Vein is perhaps the next in importance to the Old Vein, or at any rate has been so in the past, though the Back Vein, which is now being worked by three of the principal quarries, bids fair to rival it in the matter of output. The slates from the New Vein are of a somewhat rougher texture than those of the Old Vein. The surface is coarser and more gritty, and the colour perhaps rather more grey and less blue. Some of the better beds worked in this vein, however, produce a very high-class of slate. Messrs. J. W. Greaves & Sons at the present time work some of the finest beds ever encountered in this vein, for which they have adopted the trade name of Deep Vein by way of distinguishing them from the general ruck of New Vein slates, which are of scarcely equal quality.

The Oakeley Company turn out from the New Vein some heavy slates $\frac{1}{3}$ inch to $\frac{1}{2}$ inch thick in random sizes. These make a very striking and picturesque roof when laid in diminishing courses. Such a roof was exhibited by this company at the Building Trades Exhibition held at Olympia last spring, and attracted much attention from architects.

The quarries working New Vein are the Oakeley, Messrs. J. W. Greaves & Sons, and Diphwys Casson.

*The Back Vein.*—The peculiar feature of the Back Vein is that the cleavage surface generally presents a slightly stripy or, as it is locally called, "barred" appearance, and also in places shows a faint mottling, which, though highly characteristic, is only discernible on close observation. The banding is more a matter of a difference in texture than in colour, and is not distinctly observable except at close quarters. It is altogether a different thing, as far as appearance and effect go, to the dark bands known as "ribbons" which cut across certain Pennsylvania slates, or the light green bands found in some of the Bangor purple slates. The bands are caused by the cleavage cutting across the original bedding of the rock, and as there is often misconception on this point it should perhaps be added that there is no tendency for the slate to break in the direction of the band. In the geological process of formation into slate the beds have been consolidated and cemented together into one mass. So thoroughly has this process been carried out in the case of the Back Vein slates that if broken under pressure they yield more readily in a direction at right angles to the original bedding than in the direction of the bands or "bars."

It is a question if the lack of uniformity in appearance in the Back Vein is any real disadvantage to the slates when placed on a roof, but in the trade at least a slate of plain and unstreaked surface like the Old Vein is generally preferred. Back Vein slates, as well as New Vein, are accordingly placed at a somewhat lower price than Old Vein, and with this in their favour find a very large sale in the home market.

The Votty and Bowydd and Maen Offeren quarries produce the largest quantity of Back Vein slates. The vein reaches its largest development in these two quarries, and nowhere else is it extensively worked, though Messrs. Greaves's quarry produces a certain quantity of slates from it.

*The North Vein.*—This vein is not worked to any great extent at the present time, but has been worked in recent years by the Oakeley Company, and some time ago by the Maen Offeren Company. Most of the slates obtained from it are of much coarser texture than those from the other veins. The cleavage is not very good, and hence it is difficult to make any but heavy slates from it. Where a thick, rough-surfaced slate is required the North Vein slates make a very strong and substantial roof. The colour is somewhat darker and less blue than Old Vein.

*Craig Ddu and Bwlch Slater Vein.**—The Craig Ddu and Bwlch Slater quarries work a slate vein which cannot be identified with any of those previously described. The slates from it, however, somewhat resemble Back Vein. They are barred in a similar manner to the Back Vein slates, have a very fine-grained surface, and are noted for their strength, straightness, and entire freedom from iron pyrites. The cleavage in the best beds of this vein is excellent and permits of the slates being split to any thickness.

*Wrysgan Veins.*—The Wrysgan quarry works two veins which are known as the Upper and Lower Veins. These again cannot be identified with those worked in any of the other quarries. Of the two the Upper Vein produces the superior quality of slates. The cleavage in this vein is good, and the slates made from it are straight and have a smooth surface.

The cleavage of the Lower Vein is not so well developed as that of most of the Festiniog veins. The slates made from it are therefore rather thick. They are also barred, but are a good strong slate of a heavier type than the average product of the Festiniog quarries.

The illustrations accompanying this article show typical quarry scenes.

SPLITTING PORTMADOC "OLD VEIN" SLATES.

The first shows men quarrying the slate rock in the open workings, where the cleanness of the natural joints is seen to the best advantage, a special feature of the Festiniog quarries. The second is a view in one of the slate mills of a slatemaker splitting slates. In this the wonderful cleavage and great strength of the rock is well demonstrated by the long split in the large-sized slate the man is making with his chisel.

The photographs from which the blocks were obtained were taken by Mr. J. C. Burrow, of Camborne, Cornwall.

THE Kent Education Committee have approved plans for the enlargement or the erection of the following schools:—Cliffe Council, infants, accommodation 80; Guston (voluntary), mixed and infants, present accommodation 84, increased accommodation 106, new class room; New Romney (voluntary), mixed and infants, present accommodation 227, increased accommodation 264, new class room.

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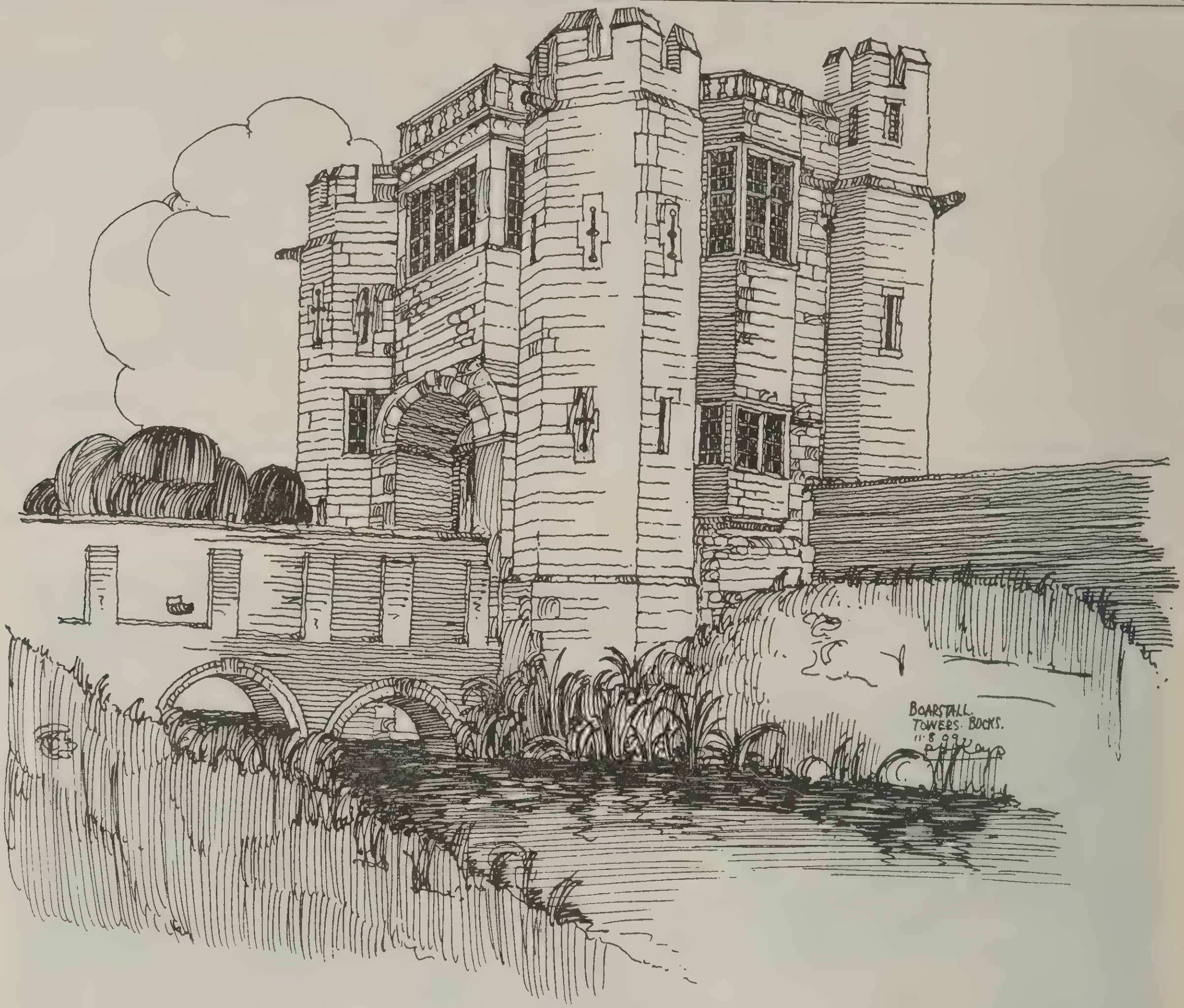
* It was stated in the previous article that this vein and the Wrysgan vein might be the same. The writer has since been advised that there is no foundation for this.


BOARSTALL.
TOWERS. BUCKS.
11.8.99.
P.H. Keys

BOARSTALL TOWERS, BUCKS.—From a Sketch by Mr. P. Hubert Keys.

This old keep, on the borders of Oxfordshire, is all that remains of a fine old Tudor mansion destroyed during the Civil wars.

## COMPETITIONS.

Acton.—The R.I.B.A. Competitions Committee are considering the conditions of the competition for a new school at Acton, London, W., with a view to their amendment.

Ireland.—The Royal Institute of the Architects of Ireland report that the conditions attached to the competition for new Council offices for the Meath County Council are unsatisfactory.

Scotland.—The conditions of the Renfrew Parish Council competition, which were criticised in our issue of March 4, have been considered by the Glasgow Institute of Architects. Members have been informed that they should refrain from competing.

Walsall.—The Secretary of the Royal Institute of British Architects desires us to announce that the Competitions Committee are considering the conditions of the Walsall (Bloxwich) school competition with a view to their amendment.

## CORRESPONDENCE.

Messrs. Hofler, Ltd., Soho Square, W., ask us to publish the following letter:—

Central Criminal Court,
City of London, E.C.:
March 15, 1910.

Messrs. Carl Kleinhans, Alexander George Lee
and Ernst Haensel, separately.

Dear Sirs,—Having libelled you in certain letters written by me to you and to other persons, including Mr. Shand Kydd, and having been committed to take my trial in respect of such libels, I desire to retract and withdraw the whole of such libellous statements and to admit that there is no foundation for the charges I have made against you.

I further undertake to pay the costs of the proceedings as between solicitor and client forthwith.

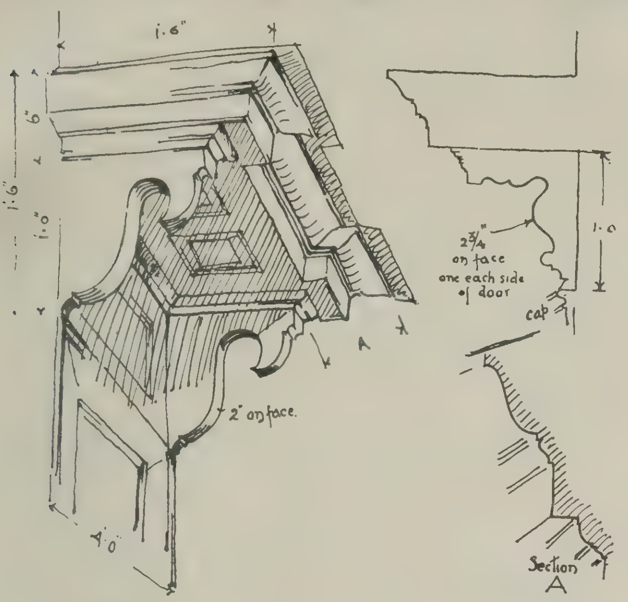
My explanation is that the letters complained of were written by me whilst I was in a state of mental collapse resulting from overwork, excitement and grave disappointments, which caused me to labour under misapprehensions which during severe strain became exaggerated out of all proportion, and prompted me to make statements which, after due reflection in a state of composure, I deeply regret and unreservedly withdraw. I desire sincerely to apologise to you and all others concerned, and solemnly promise not to repeat such conduct, but, on the contrary, to make good, as far as is in my power, any harm that may have accrued therefrom.

You are at liberty to use this apology in any manner you may think fit.

(Signed) Wilhelm Hofler.

The Egyptian Customs Authorities invite tenders for the rebuilding of the burned tobacco stores of the Customs House at Cairo. Tenders must be made out on stamped paper (obtainable from Mr. A. L. Webb, C.M.G., Queen Anne's Chambers, Broadway, S.W.), and sent to the Director-General of Egyptian Customs, Alexandria, before March 31. A deposit of E4,000*l*. will be required with each tender. It is to be noted that legal domicile in Egypt is necessary. Copies of the plans, specifications, &c., may be seen by British contractors at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

The Edinburgh and District Water Trustees have decided to print the following notice on the assessment notices:—"The Trustees beg to draw the attention of occupiers of houses to the importance of seeing that their cisterns are cleaned out once every six months, or oftener if required by the authorities. This should be done by brushing only, and there should be no scrubbing with freestone, sand, or chemicals. Particular care must be taken that the cisterns are all kept securely covered by a close-fitting lid, in order that dust and other matter may be prevented getting into them and contaminating the water."



A DOORHEAD. From a Sketch by Mr. Banister F. Fletcher, F.R.I.B.A.

## TRADE NOTES.

Messrs. Chas. Knowles & Co., Ltd., have removed their West End show room to 495 Oxford Street, just near the Marble Arch. These are larger and more convenient premises, and afford special opportunity for a good display of their art wall papers.

The Northern Asphalte Co. send out from the Standard Works, Leeds, an enormous quantity of pure bitumen damp-proof courses. Their "Dreadnought" quality, in rolls of 8 yards long, has been approved under the Manchester and Salford new building by-laws. It is a good thing to stock, as it does not stick together when rolled.

Messrs. Wm. Moore & Co., Lauderdale Buildings, Aldersgate Street, E.C., have just issued a new leaflet price list of their dust-sheets for decorators, &c., their cleaning requisites, tarpaulins, and other specialities. The strong special calico dust sheets are stocked in four sizes from 10 feet by 6 feet to 12 feet square, but any other size will be quoted for. Messrs. Moore are willing to send all their articles for inspection.

The Wellington Tube Works, Ltd., Great Bridge, Tipton, have prepared and copyrighted an approximate net price list which should be of great value to plumbers, gas-fitters, and other users of tubes. At present buyers are hampered by an intricate system of discounts. This will now be obviated by the tabular list of the Wellington Tube Works, which gives in the top line the internal diameter of gas, steam and water tubes from ⅛ inch to 6 inches, while below it, arranged in columns, is the corresponding gross price per foot, and then the net cost at discounts from 35 per cent. to 90 per cent. The various discount prices can thus be seen at a glance. The idea is an excellent one, and should be heartily welcomed by harassed purchasers. A copy of the card will be sent on application.

A description recently appeared in the *Daily Telegraph* of the lift installation introduced into the Royal Liver Building, Liverpool—the first British skyscraper. The contract (which is the largest ever placed with a British firm for the equipment of one building) was let to Messrs. R. Waygood & Co., Ltd. The American idea of arranging the lifts in batteries is carried out. Right in the centre of the building there will be a battery of ten lifts. Of these six will be called "express" lifts. They will move at a speed of 400 feet per minute, and will only stop at certain floors. There is also a battery of four similar lifts at the pierhead entrance, with another lift at a private entrance. The signalling arrangements for the lifts are right up to date. The device is ingenious. A passenger on entering the building can tell at a glance which lift will be available to take him to the floor which he desires to reach. The various lift attendants can communicate with each other when a signal is received. Telephones and automatic lights are used.

On the occasion of the opening of the Hospital for Invalid Gentlewomen, Lisson Grove, by the Prince and Princess of Wales last week, the automatic electric passenger lift installed by Smith, Major & Stevens, Ltd., was used by their Royal Highnesses. This machine is up to date in every respect. No attendant is required. On each floor served is a button push, momentary pressure of which will call the lift if not already in use. When it arrives at the landing the door may be unlocked and the cage entered. After entering the cage the landing door must be again closed and locked by the simple movement of a lever, otherwise the control circuit is interrupted and the cage cannot be moved. In the cage are placed button pushes corresponding to the floors. The pressure of any button will send the cage to the corresponding floor. A stop button will stop the cage if a wrong button has been pressed. When the lift is in use all the controlling buttons are dead, so interference when the passenger is using the lift is impossible. No door can be unlocked or opened when the cage is not standing opposite that particular door. The action of locking a door simultaneously restores the electric circuit. We understand Messrs. Smith, Major & Stevens, Ltd., have recently erected eight lifts worked on this principle at the new offices of the *Morning Post* newspaper, Strand.

## EASTER HOLIDAY ARRANGEMENTS.

The special programme of excursions issued by the Great Central Railway contains an almost unlimited choice of resorts suitable for all tastes and requirements. The arrangements for Thursday, March 24, embrace nearly 600 seaside and inland resorts, extending through the Midland Counties, Yorkshire, Lancashire, North-East and North-West Coasts, and North of England generally. Arrangements have been carefully made to shorten the journey of the long-distance traveller by bringing his destination as near to London as possible in point of time. Special corridor trains leave Marylebone on Thursday, March 24, at 8.45, 10.0 a.m., 12.5 p.m., 3.15, 3.20, 4.30, 6.20, 10.0 p.m., and 12.30 midnight; and special trains will also be run on Good Friday, Saturday, Sunday, and Monday (Bank Holiday).

Other noticeable features of the programme are the issue of Saturday to Monday week-end tickets, frequent day and half-day facilities to the picturesque and historical villages in Middlesex, Herts, and Beechy Bucks. Special low fares are announced for walkers and cyclists available from Marylebone by any train on any day, and from Saturday to Monday. Copies of this comprehensive publication may be obtained free of charge at Marylebone Station, Great Central Company's Town Offices and Agencies, or by post from Publicity Department, 216 Marylebone Road, N.W.

Excursion tickets will be issued by the South Eastern and Chatham Railway to Paris by a special service, *viâ* Folkestone and Calais, leaving Charing Cross at 2.50 p.m. on March 24, reaching Paris at 10.50 p.m., also *viâ* Folkestone and Boulogne, by the services leaving Charing Cross at 10.0 a.m. and 2.20 p.m., on March 23, 25 and 26, and at 10 a.m. on Thursday, March 24, and by the Night Mail Service leaving Charing Cross and Cannon Street at 9.0 p.m. each evening from March 23 to 26 inclusive, *viâ* Dover and Calais. Returning from Paris at 8.20 a.m. or 2.30 p.m., *viâ* Boulogne, or 9.15 p.m. *viâ* Calais any day within fourteen days. A special service to the French Riviera, *viâ* Folkestone and Calais, by which cheap tickets to Cannes, Nice, Monte Carlo, Mentone, &c., will be issued, leaving Charing Cross at 2.50 p.m. on March 24. A cheap excursion to Boulogne will leave Charing Cross at 2.20 p.m. on Saturday, March 26, and Sunday, March 27; returning at 12.0 noon, or 7.10 p.m. on Easter Monday. The Casino at Boulogne will be open from March 24 to 29 inclusive. Similar tickets will also be issued to Calais. On Good Friday, Easter Sunday and Easter Monday, special day excursions will be run to Boulogne and Calais. Special cheap eight-day return tickets to Amsterdam, The Hague, and other Dutch towns, *viâ* Queenboro' and Flushing, will be issued from March 23 to 28 inclusive, leaving Victoria and Holborn at 9.42 a.m. Cheap eight-day return tickets to Ostend will be issued from March 23 to 28, inclusive. During the holidays the Continental services will run as usual. A special Restaurant Car Express Service to Switzerland, *viâ* Dover, Calais, Laon and Bale will leave Victoria at 8.50 p.m., Herne Hill 8.55 p.m., Charing Cross 9.0 p.m., and Cannon Street 9.5 p.m. on March 24.

Return tickets to Tunbridge Wells, St. Leonards, Hastings, Bexhill, Canterbury, Whitstable, Herne Bay, Birchington, Westgate, Margate, Broadstairs, Ramsgate, Sandwich, Deal, Walmer, Dover, Folkestone, Shorncliffe, Hythe, Sandgate and New Romney (Littlestone-on-Sea), will be issued from London and certain suburban stations by any train (mail and boat expresses excepted) on March 24, 25, 26 and 27, available for return on or before March 29, but not on day of issue. Cheap day excursions on Good Friday and Easter Monday will be run from the principal London stations to Ashford, Canterbury, Deal, Tunbridge Wells, Hastings, Bexhill, Whitstable, Herne Bay, Ramsgate, Broadstairs, Margate, Sandgate, Folkestone, Dover, &c. On Easter Monday cheap day tickets will be issued to many places of interest, and from London to the Crystal Palace (High Level), including admission. Full particulars of the Continental and home excursions, extension of time for certain return tickets, alterations in train services, &c., are given in the special holiday programme and bills.

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For visiting Holland and Germany during the Easter holidays the Great Eastern Railway Company's Hook of Holland route offers exceptional facilities. Passengers leaving London in the evening, and the northern and midland counties in the afternoon, arrive at the chief Dutch cities next morning. A corridor restaurant train is run between London and Harwich. From the Hook of Holland through carriages and restaurant cars run in the north and south German express trains, reaching Cologne at noon, Bale and Berlin in the evening. Reduced fares have been arranged by the Harwich-Antwerp route for passengers wishing to visit Brussels. Tickets dated in advance can be obtained at the Liverpool Street Station Continental inquiry or booking offices. The Danish Royal mail steamers of the Forenede line of Copenhagen will leave Harwich for Esbjerg (on the west coast of Denmark) on Thursday, March 24, Saturday, March 26, returning March 29 and March 30. The General Steam Navigation Company's steamers will leave Harwich for Hamburg on March 23 and 26, returning March 26 and 30.

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## VARIETIES.

The Tiverton Town Council, having decided to erect a new boys' school in Westexe, recommend the education committee to throw it open to competition, but without any premium.

The Maxwelltown Town Council have passed plans for a factory to be erected in King Street, Maxwelltown, for Mr. J. Steel for the manufacture of gloves and neckties. The plans provide accommodation for forty workers in the first instance, and there is room for future extensions.

A students' conversazione in connection with the Polytechnic Schools of Engineering and Architecture was held on the 11th inst. in the Regent Street premises. Mr. A. Dykes Spicer distributed the medals, prizes and certificates gained during the year.

A company is in process of formation for the erection of a Queen's Hall in Northumberland Street, Newcastle-on-Tyne. The building is estimated to cost 32,000*l*. The plans, which have been passed by the Corporation, were prepared by Messrs. Graham & Hill, architects, of Newcastle.

The Sheffield and Ecclesall Co-operative Society have adopted a scheme for the erection of a new central store in Sheffield. The premises and offices will have a frontage of 80 feet to Ecclesall Road and 100 feet to Cemetery Road. The plans have been prepared by Mr. H. L. Paterson, A.R.I.B.A., Sheffield.

A cargo of about 350 tons of grey granite blocks has been sent over from the United States to Aberdeen by the Douglas Granite Company. If the experiment is successful a further 1,000 tons will be immediately shipped. A similar attempt at importation failed about fifteen years ago owing to the cost of the imported material.

The Co-partnership Tenants have, it is said, acquired the Childwall Estate, near Liverpool, amounting to 170 acres, from the Marquis of Salisbury. The Childwall scheme provides sites for some 1,200 houses with gardens, after leaving ample space for avenues, tennis lawns, recreation grounds, and sites for halls and other social institutions.

The Woking Urban District Council have approved the architect's plans of the technical institute and secondary school, which had been prepared for submission to the Board of Education, and a copy of the quantity surveyor's estimate, from which it appeared that the estimated cost, irrespective of the purchase of the site, would be 23,397*l*.

A company has been formed to erect "silos" (storehouses) at Rotterdam for cleaning, drying and storing grain. Application is to be made to the Town Council for a site alongside the Maas Harbour, and a contract is to be entered into with the port authority for the supply of electric power. The estimated cost of the buildings and the electric installation is stated to be 58,000*l*.

The Faversham Town Council have resolved to apply to the Local Government Board for sanction to a loan of 37,483*l*. for the sewage disposal scheme. The total is divided into four separate amounts, viz., 3,700*l*. for land (repayable in sixty years), 25,624*l*. for works, buildings, &c., (repayable in thirty years), 4,342*l*. for machinery (repayable in fifteen years), and 4,177*l*. for other purposes (repayable in thirty years).

An influential British committee is being formed in connection with the International Hygiene Exhibition at Dresden in 1911. All the countries of Europe, the United States, Mexico, Argentine, and Japan, are to take part in the exhibition. The scientific department will have twelve principal group classifications, of which the two first are:—(1) Air, light, soil, water; (2) settlements and dwellings, including houses and habitations, light, heating, water supply, &c.

The *Diario Oficial*, of Uruguay, publishes a notice inviting tenders for the construction of two warehouses and six storing depôts for the Montevideo docks. The buildings are to be of reinforced cement. Tenders, which will be opened on June 1, should be addressed to the "Consejo de Administración del Puerto de Montevideo (Oficina de Trafico y Conservación), Calle Cerrito 185," Montevideo. Plans and specifications relative to the above may be seen at the same address.

According to the *Rangoon Gazette* of February 14, the administration report of the Public Works Department of Burma for 1908-9 states that works are projected at a total approximate cost of 58 lakhs. Amongst these are the following:—Contagious diseases hospital at Kandawgalay, 2 lakhs; smallpox hospital at Kambe, 3¾ lakhs; additional accommodation for Rangoon town police, 5 lakhs; central lunatic asylum, 10 lakhs; extensions to Rangoon College, 4 lakhs; Rangoon Museum, 3 lakhs. (Lakh = 100,000 rupees = 6,667*l*.)

The Council of the Royal Institute of the Architects of Ireland held a meeting last week, when a letter was read from the city treasurer with reference to the proposed extension of the municipal buildings, Dublin, and it was decided to ask the Corporation to receive a deputation from the Council on the subject of instituting a competition for the buildings, limited to architects practising in Ireland. The question of a competition for the new University buildings was also under consideration.

The Liverpool Workhouse Committee will shortly carry out improvements at the Brownlowhill Workhouse in consequence of representations by the Local Government Board. It is proposed, amongst other things (1) that two additional sanitary towers be erected in connection with the men's hospital, one adjoining the acute wards and the other in connection with the infirm wards; (2) that the central sanitary tower on the female side of the hospital be enlarged; (3) that the whole of the kitchen, scullery and bath accommodation of the lying-in wards be reconstructed; (4) that a lift be provided in connection with both men's and women's hospitals. The cost is estimated roughly at 8,000*l*.

The Glasgow master joiners and their men having failed at their conciliation board to settle their present difference as to hours and wages, the matters in dispute will go before a conciliator nominated by the Board of Trade. The men asked for an eight-hours' day for the first five days of the week, and four hours on Saturday, making forty-four hours per week, as compared with fifty at present, and also for an advance of wages from 9*d*. to 10*d*. per hour. The employers, on the other hand, wish the working hours to be fifty-one per week, and they decline to grant any advance of wages. They wish the joiners to work one hour more on Saturdays than at present, so that they may stop at the same time as their other men.

The Agent-General for Queensland has received a letter from a working carpenter who arrived in the State early last year from England, which indicates how great is the demand for labour in Northern Queensland. He says:—"I arrived early in January 1909; I soon got employment near Cairns, North Queensland. During the year I have been in the State—I arrived with only 3*l*. 11*s*. in my possession—I have paid all my living expenses, and now have to the credit of my banking account, saved out of earnings, the sum of 80*l*., to which I expect to add considerably during the present year. I am still doing well."

Proposals are under consideration for remodelling and extending the Royal Exchange buildings in Glasgow, with the view of providing better facilities for the members. The plans comprise an extension of the general meeting room, and the addition of more convenient writing, reading, smoking, and cloak rooms, &c.; and they also provide for modernising the present letting offices, and increasing their number by the addition of one or more storeys. The extra storey or storeys will be confined to the western portion of the building, so as to avoid any interference with the fine front in Ingram Street. The plans have been prepared by Mr. Alexander N. Paterson, architect, Glasgow.

An inquiry was held last week in the Council Chambers, Govan, into an application by the Town Council to the Secretary for Scotland for a Provisional Order to authorise them to increase their borrowing powers in connection with the sewage scheme from 20,000*l.* to 73,000*l.* The former sum was authorised under the Act of 1898, but in the interval the scheme has been greatly extended. When the original estimates were framed, 10*l.* per yard was generally accepted as an outside figure to allow for construction of sewers such as were required for Govan, but experience both of contractors and Glasgow Corporation showed that the cost was as much as 25*l.* per yard. Another reason is that the boundaries have been extended, and there is a considerably longer sewer to be constructed. Mr. F. G. Holmes, burgh engineer, Govan, and Mr. William Cecil Easton, C.E., Glasgow, explained the scheme.

Mr. William M. Mitchell, R.H.A., died on Saturday at his residence, Abbeylands, Killiney, at the age of sixty-seven. He had been in delicate health for the past few months. Mr. Mitchell was a well-known architect and a past President of the Royal Institute of the Architects of Ireland. He designed several important public buildings, amongst which were the City of Dublin Technical Schools, the Masonic Female Orphan School, the Métropole Hotel, Dublin, Messrs. Todd, Burns & Co.'s new premises in Mary Street, the Spa Hotel, Lucan, the Methodist Church, Clontarf, &c. For some years past his two sons have been associated with him as partners, and they will carry on the practice.

## THE CANAL COMMISSION REPORT.

In 1906 the Royal Commission appointed to inquire into and report on the Canals and Inland Navigations of the United Kingdom began their sittings. The order of the inquiry was drawn up as follows:—(1) Their present condition and financial position; (2) the causes which have operated to prevent the carrying out of improvements by private enterprise, and whether such causes are removable by legislation; (3) facilities, improvements and extensions desirable in order to complete a system of through communication by water between centres of commercial, industrial, or agricultural importance, and between such centres and the sea; (4) the prospect of benefit to the trade of the country compatible with a reasonable return on the probable cost; and (5) the expediency of canals being made or acquired by public bodies or trusts, and the methods by which funds for the purpose could be obtained and secured; and what should be the system of control and management of such bodies or trusts.

After examining 266 witnesses and having 106 sittings, the Commissioners drew up the following recapitulation of the more important steps to be taken to give effect to the policy of unifying inland waterways. Except in regard to the first of these steps, viz., the formation of a Waterway Board, which they describe as "the most urgent part of our recommendations," they say:—"We do not wish to attach importance to the exact order in which each successive measure should be adopted. We desire rather again to indicate that the work of carrying our entire scheme into effect must be gradual—although we trust that it may be continuous—each stage of the execution of the scheme being necessarily preceded by a careful estimate of the probable cost of improvement, and of the prospects of traffic and of an adequate return, direct and indirect, on this expenditure."

The summary of recommendations is as follows:—

"The financial assistance which we recommend that the State should give first, for the acquisition, and secondly, towards the improvement of waterways is already indicated. We have made suggestions on the subject of local assistance, either in contributions, or local works, or guarantees, or otherwise. It would be necessary to ascertain, as regards each successive measure of improvement which the Waterway Board take up, to what extent assistance would be rendered by some at least of the localities and interests that would receive benefit.

"We further recommend:—

"1. That the first measure should be the appointment of a central Waterway Board for Great Britain.

"2. That, either by the Act constituting that board, or in an early scheme proposed by them and submitted to Parliament, the waterways comprised in the four main routes which we have described should be vested in the board, to whom the administration of all waterways vested in them should be entrusted.

"3. That if, for financial or other reasons, the larger works of improvement, which we should desire to see commenced at once, have to suffer some postponement, the unification of these waterways and the transfer of their administration to the Waterway Board should nevertheless be effected without delay. We consider that this will be a most important step forward, especially if accompanied (*a*) by such minor improvements as the Waterway Board may consider desirable, and (*b*) by some reduction of tolls consequent on unification.

"4. That, on appointment, the Waterway Board should review the whole situation on the lines of practical business indicated, with special regard to finance and the benefit to trade and public interests, to the extent of local assistance, to prospects of traffic, and to competition with railways. If satisfied that the improvement of the four main routes, or of one or more of them at a time, would be desirable, on these lines, the Waterway Board should propose a scheme or schemes for submission, if approved by your Majesty's Government, to Parliament. If the alternative course set forth be adopted, such scheme or schemes will be submitted in the first instance to the Development Commissioners.

"5. That, when satisfied of the expediency of acquiring and unifying any further waterways, either as branches or feeders of the main routes, or subsequently in other parts of England and Wales, or at any time in Scotland, the Waterway Board should propose further schemes from time to time. These schemes would set forth the nature and extent of the improvements proposed to be carried out by the Waterway Board on each waterway.

"6. That the acquisition of any British waterways of importance now in the hands of railway companies should be included in one or more of the earlier schemes.

"7. That the Caledonian and Crinan Canals, and the projects for their improvement, should be among the interests confided to the care of the Waterway Board.

"8. That it is worthy of careful consideration whether the collection of information as to the flows of rivers and streams, and as to water-supplies in the districts of Great Britain where there are navigable waterways, should not also be entrusted to the Waterway Board.

"9. It should also be considered in the future whether this board should not be assisted by local advisory committees, representing local interests at the more important centres of origin or delivery of traffic.

"10. That the alterations in the existing laws or principles of procedure indicated in our report as desirable should be considered."

## TRADE MARKS OF CONSTRUCTIVE MANUFACTURERS.

We have received from L'Agence de Brevets et Marques de Fabrique, Jacques Gevers et Co., 70 Rue Saint-Jean, Antwerp, the following list of trade marks published in December 1909 and January 1910:—

ENGLAND.

*Cement.*

| | |
|---|---|
| "Feusol" | Kerner-Greenwood & Co., St. Ann's Offices, St. Ann's Street, King's Lynn, Norfolk. |
| "Vianex" | The Barnstone Blue Lias Lime Co., Ltd., Barnstone, Nottinghamshire. |

*Constructive Materials.*

| | |
|---|---|
| "Copenacre Ground" | The Bath Stone Firms, Ltd., 6-7 Kingston Buildings, Abbey Yard, Bath, Somersetshire. |
| "Nipsol" | William Bennett Snell, Treville Street, Plymouth. |
| "Dainty White" | G. & T. Earle, Ltd., Dalton Street, Wilmington. |
| "Erlite" | G. & T. Earle, Ltd., Dalton Street, Wilmington. |
| "Knowlit" | William Humphrey Knowles, Queen's Road, Battersea, London, S.W. |
| "Carbojen" | C. Jennings & Co., 146 Pennywell Road, Bristol, timber merchants. |
| "Neumonite" | F. Chiesman & Co., 14-20 St. Mary Axe, London, E.C. |

| | |
|---|---|
| “Stocal” | The Permanent Decorative Glass Co., Ltd., Queen's Mill, Queen Street, Lancaster. |
| “Permatilhic” | George M. Callender & Co., Ltd., 25 Victoria Street, London, S.W. |
| “Purexide” | Purex, Ltd., Greenford Colour Works, Greenford Green, Harrow. |
| “Teakoid” | John Broadfoot & Sons, Ltd., Inchholm Works, 6 James Street, Whiteinch, Lanarkshire, N.B. |
| “Permanent” | William Miller, 29 Mowbray Street, Nottingham. |
| “Marbeletic” | Marchetti Brothers, 73, 75 and 77 Copnor Road, Portsmouth. |
| “Muribloc” | Muribloc, Ltd., Prince's Wharf, Jew's Row, Wandsworth, London, S.W. |
| “Tarafirma” | Tarafirma, Ltd., 17 Victoria Street, Westminster, London, S.W. |
| “Sampittic” | John Hutchinson, 141 Ebury Street, London, S.W. |

### DENMARK.

*Cement.*

| | |
|---|---|
| “Kongsdal” | Cementfabriken Kongsdal, Aktieselskab, Kobenhagen. |

*Constructive Materials.*

| | |
|---|---|
| “Kongsdal” | Cementfabriken Kongsdal, Aktieselskab, Kopenhagen. |

### GERMANY.

*Cement.*

| | |
|---|---|
| “Zullichol” | Carl Züllich, Leipzig, Lindenau. |
| “V.S.” | Valentin Schultheiss, Kulmbach, Bahnhofspl. |
| “Rennes” | Fränkische Portland-Cement- und Kalkwerk-Akt.-Ges., Hersbruck. |

*Constructive Materials.*

| | |
|---|---|
| “Anker” | Hermann Paul, Breslau. |
| “Rat” | Arnold Otto Meyr, Hamburg. |
| “Engelswerk” | Engelswerk, C. W. Engels, Foche b. Solingen. |
| “Kamel” | Frank Reddaway, Wien. |
| “S.S.” | Engelswerk, C. W. Engels, Foche b. Solingen. |
| “Schwa-wu” | Henry Zitzer, Hamburg. |
| “Silesia” | Carl Henckell, Hamburg, Hopfenfack. |
| “Triumph” | Carl Henckell, Hamburg, Hopfenfack. |
| “V.” | Carl G. Voigt, Hamburg. |
| “Singa” | Barmer Export-Gesellschaft mit beschränkter Haftung, Unter-Barmen. |
| “A B C” | J. D. Schmidt & Lohmann, Remscheid-Bieringhausen. |
| “Hœstatia” | Carl Henckell, Hamburg, Hopfenfack. |
| “Sirius” | Carl Henckell, Hamburg, Hopfenfack. |
| “Plastrumit” | Senfarth, Hamburg, Neueberg. |
| “Gluckskugel” | J. E. Evers, Wansbek. |
| “Acta” | Anhaltische Tonwerke A. Wilkendorf, Coswig, Anhalt. |
| “Schilpp's Ideal-Estrich” | Schilpp & Wolff, Frankfurt a. M. |
| “Petrefakt” | Ludwig Kerkow, Gross-Buchholz b/Hannover. |
| “Höllenstein” | Deutsche Glascementwerke, G.m.b.H., Kiel-Gaarden. |
| “Durolith” | Durolith-Werke, G.m.b.H., Hamburg. |
| “Fiat” | Westfalia Fabrik dekorativer Wandbekleidungen, G.m.b.H., Hilchenbach. |
| “Radium” | Albert Carl, Nirdorf, Berlin. |
| “Zullichol” | Carl Züllich, Leipzig, Lindenau. |
| “V. S.” | Valentin Schultheiss, Kulmbach. |
| “Ultra-Capital” | Seebohm & Dieckstahl, G.m.b.H., Mannheim. |
| “Jungfer” | Wilhelm Michael Dubois, Frankfurt a. M. |
| “Huralumin” | Dürener Metallwerke, Aktien-Gesellschaft, Düren. |
| “J. E. P.” | Eugen Post, Cöln, Lindenthal. |

### BELGIUM.

*Cement, &c.*

| | |
|---|---|
| “Le Plomb” | Société Anonyme des Carrières de Baulx et de Gaurain-Ramecroix (anciens établissements Alex. Dapsens), Baulx p. Tournai. |
| “Drago Brand” (volcan) | Lemaire et Co., Antoing. |
| “Tortoise Brand” (dessin tortue) | |
| “Canoa” (bateau, étoile) | |
| “Montre” (dessin) | |
| “F. L.” | |
| “Belem” | |
| “Jouque Brand” (bateau) | Sainte-Ame. Cimenteries et Briqueteries. Brussels. |
| “Sun Brand” (soleil) | |
| “Saxonia” | Radolphe Wolle, Leipzig (Allemagne). |

*Roof Covering.*

| | |
|---|---|
| “Congo” | Barrette Manufacturing Co., New York. |
| “Crowned Hand” | The Antwerp Portland Cement Works, Antwerp. |
| “Defenza” | Virabian & Co., Marseilles (France). |

*Parquet.*

| | |
|---|---|
| “Parquetine” | H. et P. La Chapelle, firme Aug. La Chapelle, Antwerp. |

### SWEDEN.

*Constructive Materials.*

| | |
|---|---|
| “Tamora” | August Blumenthal, Firma, Hamburg. |
| “Medea” | August Blumenthal, Firma, Hamburg. |

### FRANCE.

*Cement.*

| | |
|---|---|
| “Sayoto” | M. Beaumont, 57 Rue Saint-Jérôme, Lyon. |
| “Le Joint” | Julien Valenpint, 48 Avenue Victor Hugo, Paris. |
| “Freydier” | Eugène Freydier, Savane. |
| “Defensa” | P. Virabian et Cie. Marseille. |
| “L'Univers” | Société Anonyme des Ciments Portland Artificiels d'Origny-Sainte-Benoîte, Origny-Sainte-Benoîte. |
| “L. C.” | Léon Collomb, 3 Rue Permentier Marseille. |

*Constructive Materials.*

| | |
|---|---|
| “R. T.” | Compagnie Générale d'Electricité, 5 Bourdreau, Paris. |
| “Dresser's” | Harold Bruce Dresser, Liverpool. |
| “R. R.” | M. A. Schoelhammer, 50 Rue du Général Foy, Paris. |
| “Ombrol” | M. Gustave Boizet, Ecordal. |

### HOLLAND.

*Constructive Materials.*

| | |
|---|---|
| “Carbolineum” | G. M. Boks & Co., Amsterdam. |
| “Ceresit” | Wunner'sche Bitumenwerke-Gesellschaft mit beschränkter Haftung te Unna i/W. (Duitschland). |
| “Rutiloke” | J. J. Loke, 'sGravenhage. |
| “T. V.” | Neuchâtel Asphalt Co., Ltd., London. |

The Edinburgh Town Council have approved of a revised plan for the second portion of the buildings completing the Municipal College of Art. The estimate of the approximate cost is 70,000*l*. An appeal will be made for the 12,000*l*. required to reach that sum.

The Hampstead Borough Council has decided to purchase a strip of land adjoining the town hall for the purpose of erecting additional offices thereon. The strip is a quarter of an acre in extent, and the purchase price is 3,500*l*.

A slight improvement in the Welsh slate trade has been noticed for some weeks past, and it is believed that greater steadiness in the political situation would mean an immediate change for the better.

THE

# Architect and Contract Reporter.

FRIDAY, MARCH 25, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 Colmore Row.

*** *Entered in the United States of America as second-class matter.*

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*Subscription* $5.20.

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South Africa: *Central News Agency, Ltd.*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Ireland.—April 23.—The Meath County Council invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Apply to Mr. H. J. Cullen, Meath County Council Offices, Navan.

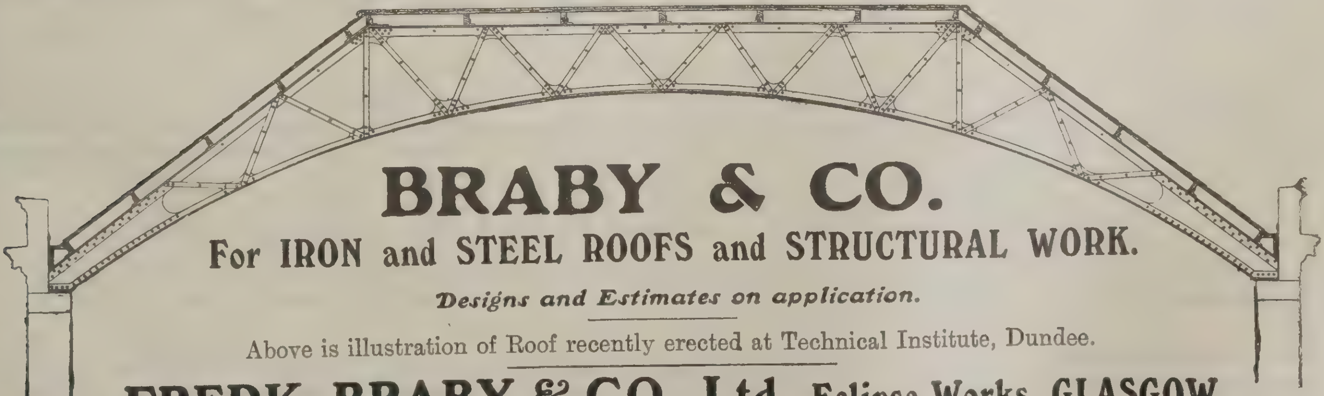
Liverpool.—The Corporation invite designs from architects practising in Liverpool for a branch library estimated to cost not more than 7,000*l*. Mr. W. E. Willink, F.R.I.B.A., will act as assessor. Apply to Mr. E. R. Pickmere, town clerk, Reference Library, William Brown Street, Liverpool.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

Sheffield.—March 31.—The Endcliffe Park Church authorities desire plans for church for 650, institute for 150, primary department for 125, junior department for 95, and caretaker's apartments. Premium, not merged in commission, 35*l*. Assessor, Mr. Chas. Hadfield, F.R.I.B.A. Deposit 5*s*. Will be returned to those who send plans to Mr. J. W. Nicholls, secretary, 64 Everton Road, Brocco Bank, Sheffield.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

Govan Town Council last week accepted the estimate of Messrs. Kinnear, Moodie & Co., of Glasgow, to construct the main sewer along Govan Road from Maxwell Street to Shieldhall, and the intercepting sewers between it and the Clyde, at a cost of 57,103*l*. 5*s*. 8*d*.



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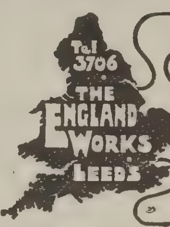

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## CONTRACTS OPEN.

Ashburton.—March 31.—For an addition to the Ashburton and Buckfastleigh Cottage Hospital. Mr. H. Mallaby Firth, hon. secretary, Ashburton, Devon.

Aston.—April 1.—For drainage work and new conveniences (builder, joiner and plumber) at the Aston Provided school. Deposit 1*l.* with the West Riding Treasurer, County Hall, Wakefield. Apply to the Education Architect, County Hall, Wakefield.

Birmingham.—April 5.—For alterations to Birmingham head post-office. H.M. Office of Works, Birmingham.

Bradford.—April 1.—For mason, joiner, plumber, and slater's work required in alterations to the Chemical Works, Frizinghall. City Architect, Town Hall, Bradford.

Bugle.—April 3.—For erection of concrete chapel at Bugle, Cornwall. Rev. J. T. Morris, Sunny Bank, Mount Charles, St. Austell.

Cambridge.—March 29.—For additions and alterations to the porter's lodge at the workhouse, Mill Road. Mr. John Congreve, clerk, 55 St. Andrew's Street, Cambridge.

Chislehurst.—March 31.—For the following works:—Erection of stables, cart-sheds, caretaker's house, mortuary, and cemetery chapel at Perry Street. Deposit 2*l.* 2*s.* Mr. H. E. Knight, clerk, Council Offices, Chislehurst.

Cirencester.—April 2.—For the demolition of buildings adjoining the police station, and construction of a new superintendent's house upon the site. Deposit 2*l.* Mr. E. S. Sinnott, M.I.C.E., county surveyor, Shirehall, Gloucester.

Delph.—March 31.—For the provision of two folding partitions at Delph Council school, for the West Riding County Council. Mr. Edgar T. Woodhead, divisional clerk, Huddersfield.

Donington.—April 2.—For erection of an elementary school for the Governors of Cowley's Charity, Donington, near Spalding. Deposit 2*l.* Mr. Jas. Rowell, architect, Church Lane, Boston, Lincs.

Egremont.—For the different artificers' work in connection with the additions and alterations to 11 Main Street, Egremont, Cumberland. Mr. Ernest Martindale, 11 Lowther Street, Whitehaven.

Forest Hall (Northumberland).—April 12.—For erection of a Council school to accommodate 370 scholars. Deposit 2*l.* 2*s.* Send names by March 29 to Mr. C. Williams, secretary to the Education Committee, The Moothall, Newcastle-on-Tyne.

Gateshead.—March 31.—For erection of the Brighton Avenue new school. Deposit 1*l.* 1*s* Mr. F. W. Purser, architect, West Street, Gateshead.

Grimsby.—March 30.—For erection of a shelter and convenience, also corrugated-iron fencing at the Playing Field, near the south end of Weelsby Street. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor, Municipal Offices, 170 Victoria Street, Grimsby.

Grimsby.—March 30.—For erection of a day room in connection with the House of Detention for Juveniles, Town Hall Square. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor, Municipal Offices, 170 Victoria Street, Grimsby.

Halifax.—March 31.—For the various works required in connection with alterations to residence, Savile Park. Messrs. Clement Williams & Sons, architects, &c., Post Office Buildings, Commercial Street, Halifax.

Halifax.—April 4.—For additions to Ashfield, Burnley Road. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Hayes.—March 29.—For erection and completion of St. Mary's Parish Room. Deposit 1*l.* 1*s.* Apply to Fairfield, High Road, Hayes, Middlesex.

High Spen and Leadgate.—March 31.—For alterations and improvements to 38 cottages at High Spen, 10 cottages at Derwent Cottages, and 4 cottages at Leadgate, co. Durham, for the Consett Iron Co., Ltd. Mr. Chas. E. Oliver, architect, company's general offices, Consett.

Ireland.—March 30.—For the erection of a public library at Ballyboden, Rathfarnham, for the South Dublin Rural District Council. Mr. T. J. Byrne, A.R.I.B.A., architect, 1 James's Street, Dublin.

Ireland.—March 30.—For erection of a terrace of six houses on the Ravenhill Road, Belfast. Mr. Thomas Houston, architect and civil engineer, Kingscourt, Wellington Place, Belfast.

Ireland.—April 2.—For erecting a residence and making additions to the Masonic Hall, Portadown. Mr. J. W. Walby, architect, Portadown.

Lincoln.—April 11.—For the construction of a brick and stone tower, 108 feet high to T.W.L., to support a spherical bottomed steel tank, containing over 300,000 gallons of water, and subsidiary works at Westgate, Lincoln, for the Corporation. Deposit 5*l.* 5*s.* with the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

Liverpool.—March 30.—For the construction of an open-air bath in Queen's Drive, Walton. Deposit 1*l.* 1*s.* Mr. W. R. Court, engineer, Municipal Offices, Liverpool.

London.—March 31.—For repairs to and reglazing of the roof of the reading-room, for the Wimbledon Public Library committee. Mr. Henry Wm. Bull, librarian, Public Library, Wimbledon, S.W.

Newport (Mon.).—March 30.—For erection of shower baths in Alexandra Road. Deposit 1*l.* 1*s.* The Borough Engineer's office, Town Hall, Newport.

Oldham.—March 31.—For the excavation required in levelling lands and building concrete retaining walls at the Market grounds, Victoria Market. The Borough Surveyor's Office.

Perth (Scotland).—April 2.—For the works to be executed in repair and re-construction of the roofing on the west side of Perth general station. The contract comprises steel and iron work, carpenter and joiner work, slater work, glazier work, plumber work, and painter work, for the Perth General Station Joint Committee. Deposit 2*l.* 2*s.* The Engineer-in-Chief of the Caledonian Railway, Buchanan Street Station, Glasgow.

Ramsgate.—March 30.—For erection of a new elementary infants' school in Lillian Road. Deposit 2*l.* 2*s.* Mr. W. T. Stock, architect, at the office of Messrs. Hinds & Sons, architects, 57 Queen Street, Ramsgate.

Scotland.—March 30.—For mason, carpenter, slater, plumber, plasterer, painter and glazier works of new offices and additions and alterations to the Manse of Insh, Kincraig, Kingussie. Mr. Alexander Mackenzie, C.E., Kingussie.

Scotland.—April 4.—For alterations at Hamilton Post Office, for the Commissioners of H.M. Works and Public Buildings. The Post Office, Hamilton, and H.M. Office of Works, 3 Parliament Square, Edinburgh.

Staffordshire.—March 28.—For erection of three cinematograph electric theatres, immediately, in Market Street, Longton; Waterloo Road, Burslem; and High Street, Tunstall, for the London Cinematograph Co., Bedford Street, London. Send in names to Mr. Bertie Crewe, 75 Shaftesbury Avenue, London, W.C., or to Mr. H. K. Hales, Market Place, Burslem.

Wales.—March 29.—For erection of 76 or more houses, proposed to be built at Tredegar, Mon. Mr. Wm. Harris, architect and surveyor, Bank Chambers, Bargoed.

Wales.—March 29.—For building forty dwelling-houses at Penalltau, Gelligaer. Mr. Geo. Kensholme, M.S.A., architect, Station Road, Bargoed.

Wales.—March 30.—For erection of stable buildings, &c., at the Blaina Inn, Blaina. Mr. B. J. Francis, architect, Abergavenny.

Wales.—March 30.—For making alterations and additions to Bethesda Chapel, Merthyr. Deposit 1*l.* 1*s.* Messrs. Johnson & Richards, architects, Merthyr Tydfil.

Wales.—March 31.—For alterations and additions to Maesydderwen to convert into county schools, for the Governors of the Ystradgynlais County School. Mr. J. Cook Rees, architect, Neath. Sealed tenders to be sent to Mr. B. L. Thomas, clerk to the Governors, Tir Roger, Ystradgynlais, by March 31, endorsed "Tender for schools."

Wales.—March 31.—For erecting a club house at Radyr, for the Golf Club. Deposit 2*l.* 2*s.* Mr. H. Snell, architect, Hickman Road, Penarth.

Wales.—April 1.—For erection of cookery-kitchen and class-room at Brynmawr Council school, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Education Committee, County Hall, Brecon.

Wales.—April 2.—For the rebuilding of two houses at Dolau, near Cardigan. Mr. J. Sambrook, Pentood Farm, near Cardigan.

Waltham.—April 5.—For the execution of alterations and repairs at the Waltham Council school, Kent. Mr. C. J. Wanley Croft, correspondent, Bridge, Canterbury.

Walton-on-Naze.—March 31.—For erection of a public Elementary school. Deposit 3*l.* 3*s.* Send names by March 31 to the architects, Messrs. Tomkins, Homer & Ley, Frinton-on-Sea.

Wednesbury.—March 31.—For the erection of public sanitary conveniences (exclusive of sanitary fittings) near the Market Place. Mr. E. Martin Scott, borough engineer and surveyor, Town Hall, Wednesbury.

Wrexham.—April 8.—For carrying out works at the Victoria school conveniences. Borough Engineer's Office, Willow Road.

# TENDERS.

## BRAINTREE.

For new boiler house and alterations to laundry, &c., for the Board of Guardians, Braintree. Mr. J. W. Start, F.S.I., architect, Colchester.

| | | | |
|---|---|---|---|
| Bulford | £1,095 | 0 | 0 |
| Rayner | 786 | 13 | 0 |
| Gladwell | 757 | 10 | 9 |
| Deaves | 747 | 0 | 0 |
| Saunders | 724 | 8 | 2 |
| Chambers | 687 | 0 | 0 |
| Smith & Son | 673 | 0 | 0 |
| Smith | 658 | 16 | 0 |
| Bailey | 652 | 0 | 0 |
| Brown & Son | 622 | 0 | 0 |
| French | 615 | 6 | 0 |
| Theobald | 603 | 0 | 0 |
| Paul | 595 | 4 | 9 |
| Grimwood & Sons | 593 | 15 | 0 |
| Spencer, Santo & Co. | 593 | 0 | 0 |
| Beaumont | 577 | 10 | 0 |
| Lason & Son | 551 | 14 | 6 |
| Hinkins & Son, Royston (*accepted*) | 543 | 0 | 0 |

## IRELAND.

For internal plumbing work in connection with the Purdysburn Villa Colony Asylum, No. 2 contract.

| | | | |
|---|---|---|---|
| Coates & Son | £7,799 | 0 | 0 |
| Higginbotham & Sons | 4,450 | 0 | 0 |
| Lowden & Co. | 4,397 | 0 | 0 |
| Patterson & Co. | 4,111 | 0 | 0 |
| McCloy | 4,087 | 0 | 0 |
| Dowling & Sons, Belfast (*accepted*) | 3,900 | 0 | 0 |

## KING'S NORTON.

For erecting public baths at the corner of Hazelwell Street and Bournville Lane, Stirchley. Mr. J. P. Osborne, architech, Birmingham.

| | | | |
|---|---|---|---|
| Sapcote & Sons | £8,439 | 0 | 0 |
| Pattinson & Sons | 7,997 | 0 | 0 |
| Gibbs | 7,983 | 0 | 0 |
| W. & J. Webb | 7,955 | 0 | 0 |
| Loud & Sons | 7,935 | 0 | 0 |
| Whitehouse & Sons | 7,860 | 0 | 0 |
| Webb | 7,859 | 0 | 0 |
| Wilkinson | 7,846 | 0 | 0 |
| Dallow & Sons | 7,580 | 0 | 0 |
| Smith | 7,495 | 0 | 0 |
| Crowder, Birmingham (*accepted*) * | 6,977 | 0 | 0 |

* For buildings only ; does not include the engineering works.

## LONDON.

For proposed extensions and alterations to factories, Holloway Road, N. Mr. George Carter, architect, 513 Holloway Road, N.

| | | | |
|---|---|---|---|
| Lowns & Sons | £1,090 | 0 | 0 |
| Brown | 1,019 | 0 | 0 |
| Scott | 730 | 0 | 0 |
| Kirby | 650 | 0 | 0 |
| Weibking & Co. | 648 | 0 | 0 |
| Stevens | 598 | 0 | 0 |
| Architect's estimate | 630 | 0 | 0 |

For the supply, delivery, and erection of smith's shop equipment for the second section of the central car repair depot for the London County Council.

| | | | |
|---|---|---|---|
| Heenan & Froude | £1,636 | 10 | 0 |
| Heywood & Co. | 1,552 | 2 | 0 |
| Alldays & Onions, Pneumatic Engineering Co. | 1,483 | 6 | 6 |
| Westminster Ventilating Co. * | 1,385 | 15 | 0 |
| Standard Engineering Co., Leicester (*recommended*) | 1,366 | 13 | 6 |
| Chief officer of tramways estimate | 1,550 | 0 | 0 |

* Not to specification.

For the execution of works at the Bishopsgate fire station, for the L.C.C.

| | | | |
|---|---|---|---|
| Holloway | £900 | 0 | 0 |
| Johnson & Co. | 875 | 0 | 0 |
| Higgs & Hill | 874 | 0 | 0 |
| F. & H. F. Higgs | 840 | 0 | 0 |
| J. & C. Bowyer, Ltd. | 827 | 0 | 0 |
| Munday & Sons, 9 Botolph Lane (*recommended*) | 817 | 0 | 0 |
| Architect's estimate | 800 | 0 | 0 |

## LONDON—*continued.*

For new road, sewers, &c., Winn Road building estate, Lee, S.E. Messrs. Lemon & Blizard, engineers and surveyors, 11 Victoria Street, Westminster, S.W.

| | | | |
|---|---|---|---|
| Shellabear & Son | £6,356 | 5 | 7 |
| Wickstead & Co. | 6,058 | 13 | 11 |
| Jones & Son | 5,746 | 0 | 4 |
| Free & Sons | 5,735 | 16 | 1 |
| Acme Flooring and Paving Co. | 5,464 | 7 | 9 |
| Wood & Sons | 5,394 | 18 | 0 |
| Watson | 5,226 | 11 | 4 |
| Muirhead & Co. | 5,206 | 17 | 3 |
| Davies, Ball & Co. | 5,198 | 11 | 8 |
| Catley | 4,932 | 0 | 0 |
| Woodham & Sons | 4,932 | 0 | 0 |
| Miskin | 4,910 | 17 | 9 |
| E. & E. Iles | 4,861 | 1 | 0 |
| Adams | 4,779 | 0 | 0 |
| Kavanagh & Co. | 4,767 | 3 | 3 |
| Wort & Way | 4,766 | 10 | 7 |
| Haringdon & Co. | 4,756 | 17 | 11 |
| Exor. of the late F. Osman | 4,750 | 0 | 0 |
| Douglas | 4,694 | 12 | 9 |
| Mowlem & Co. | 4,688 | 0 | 0 |
| Pearce | 4,682 | 0 | 11 |
| Wheeler & Co. | 4,401 | 16 | 7 |
| Fry Bros., Lion Wharf, Greenwich (*accepted*) | 4,161 | 18 | 8 |

## LONG DITTON.

For providing and laying 1,100 feet of concrete tubes, &c., in Ditton Hill Road. Mr. H. C. Fread, engineer, Thames Ditton.

| | | | |
|---|---|---|---|
| Blaker | £895 | 0 | 0 |
| Wickstead & Co. | 875 | 0 | 0 |
| Rayner | 829 | 0 | 0 |
| Hardy & Co. | 825 | 0 | 0 |
| Wheeler & Co. | 818 | 0 | 0 |
| Adams | 810 | 0 | 0 |
| Kavanagh & Co., Surbiton Hill (*accepted*) | 747 | 0 | 0 |
| May | 736 | 0 | 0 |
| Bate & Co. | 730 | 0 | 0 |
| Surveyor's estimate | 750 | 0 | 0 |

## MEXBOROUGH.

For erection of six almshouses and other works incidental thereto, at Church Street. Mr. G. Fenwick Carter, C.E., surveyor.

| | | | |
|---|---|---|---|
| Cliff & Smart | £685 | 18 | 4 |
| Surveyor's estimate | 676 | 9 | 5 |
| Smith, Mexborough (*accepted*) | 675 | 0 | 0 |
| Seagrave | 656 | 14 | 0 |

## OLDHAM.

For erection and completion of 24 houses, Hillside Avenue, Clarksfield, for the Oldham Equitable Co-operative Society, Ltd. Mr. F. Thorpe, architect, Oldham.

| | | | |
|---|---|---|---|
| Kent & Newton | £5,509 | 0 | 0 |
| Thomas Bros. | 5,470 | 0 | 0 |
| B. & J. Smith | 5,300 | 0 | 0 |
| Stump | 5,300 | 0 | 0 |
| Whittaker & Co. | 5,290 | 0 | 0 |
| S. & J. Smethurst | 5,217 | 0 | 0 |
| Bawley | 5,130 | 0 | 0 |
| Foster & Sons, Oldham and Greenfield (*accepted*) | 5,036 | 0 | 0 |

## SHEPSHED.

For erecting a handicraft centre, together with out-offices, drainage, &c., for Leicestershire County Council education committee. Mr. E. G. Fowler, architect to the committee.

| | | | |
|---|---|---|---|
| Hammond | £1,420 | 0 | 0 |
| Griffin Bros. | 1,415 | 0 | 0 |
| Haycock Bros. | 1,410 | 10 | 0 |
| Bramley | 1,405 | 0 | 0 |
| Atkin Bros. | 1,380 | 0 | 0 |
| Moss & Sons | 1,380 | 0 | 0 |
| Cole & Son | 1,359 | 0 | 0 |
| Harding | 1,329 | 0 | 0 |
| Barker & Sons | 1,298 | 0 | 0 |
| Fox | 1,295 | 10 | 0 |
| Wileman | 1,289 | 0 | 0 |
| Chapman | 1,289 | 0 | 0 |
| Potter | 1,273 | 0 | 0 |
| Faulks, Loughborough (*accepted*) | 1,238 | 0 | 0 |
| Moss & Son | 1,225 | 0 | 0 |

## LONDON.

For the supply of about 3,300 tons of Portland cement for use in connection with the L.C.C. tramways for the next twelve months.

| | (A) | (B) | (C) | (D) | (E) | (F) |
|---|---|---|---|---|---|---|
| | s. d. | s. d. | s. d. | s. d. | s. d. | s. d. |
| West Kent Portland Co., Ltd., Burham, near Rochester (*recommended*) | 18 4 | 18 4 | 16 10 | 16 11 | 16 10 | 18 6 |
| Burtt & Sons | 18 11 | 18 11 | 17 6 | 17 8 | 17 8 | 19 11 |
| Associated Portland Cement Manufacturers | 19 1 | 19 1 | 18 2 | 18 5 | 18 5 | 20 11 |
| Martin Earle & Co. | 20 0 | 19 11 | 18 6 | *18 6 | *18 6 | *19 10 |
| Wouldham Cement Co. | 19 6 | 19 6 | 18 3 | 18 3 | 18 3 | 21 6 |
| Hall & Co., Croydon | 21 3 | 21 0 | 19 9 | 20 0 | 20 0 | 20 9 |
| Peters Bros. | 21 5 | 21 2 | 19 8 | 19 10 | 19 10 | — |
| Johnson & Co. | 20 5 | 20 5 | 18 11 | 19 2 | 19 2 | 23 11 |
| Coles, Shadbolt & Co. | 19 1 | 19 1 | 20 5 | 19 5 | 19 5 | 20 10 |
| Weekes & Co. | 20 3 | 20 3 | 18 0 | 18 0 | 18 0 | — |
| Sussex Portland Cement Co. | 23 5 | 23 5 | 21 1 | 21 1 | 22 4 | 22 7 |

* Less 2½ per cent. discount.

(A) 500 tons, delivered by barge to Metropolis Wharf.
(B) 500 " " " Bridge Wharf.
(C) 500 " " " Deptford Wharf.
(D) 500 tons, delivered by barge to Battersea Wharf.
(E) } 1,000 " " " Clarence Wharf.
(F) } Clarence Wharf.

## TRADE NOTES.

Messrs. E. H. Shorland & Brother, of Failsworth, Manchester, have just supplied their patent Manchester grates to the East Hardwick schools, Pontefract. The extensions to the Pontypool General Hospital are being warmed and ventilated by means of Shorland's patent Manchester grates, Manchester stoves and ventilators. The new Post Office, Worksop, is being ventilated by means of Shorland's patent exhaust roof ventilators and special inlet ventilators. The Cottage Hospital, Marlston, is being warmed and ventilated by means of Shorland's patent Manchester grates and ventilators. The Solihull and Meriden Joint Isolation Hospital is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Failsworth, Manchester.

The Reigate Mines, Ltd., have opened up the ancient building stone mine at Clears, Reigate. It was the property of Edward III., and was then only used for work in connection with the State. This stone is a very beautiful colour, being a milky cream. Almost all the churches of Surrey have been built with it, Reigate Church being amongst them. Henry VII.'s Chapel in Westminster Abbey is also built with the material. There are some houses in Reigate over 100 years old, in which the stone looks clean and fresh and has not lost its colour. The stone is most suitable for inside work, and it carves excellently. The price is low, being 1*s.* per foot put on rail.

A large church clock has just been erected at Great Weldon, Northamptonshire, which shows time on one dial and strikes the hours. It has been made generally to the designs of the late Lord Grimthorpe by Messrs. John Smith & Sons.

## VARIETIES.

Messrs. Lister & Co., Ltd., plush manufacturers, Attleborough Mills, Nuneaton, propose to erect a large new weaving shed which will accommodate about 500 extra hands.

Mr. J. K. Hunter, architect, Ayr, has been invited by the Ayr Town Council to prepare plans for a pavilion costing about 6,000*l.*, to be erected on the Low Green.

Messrs. Robey E. Carpenter & Co., quantity and measuring surveyors, Leicester, have entirely moved their offices from 7 Humberstone Gate to 112 St. Peter's Road, Leicester. Their 'phone number 4,487 remains the same.

The burgh engineer of Edinburgh has been instructed to prepare a skeleton plan of improvements in certain parts of that city by way of experiment on the lines of the town planning scheme.

The proposal to expend 185,000*l.* in providing additional pier accommodation and otherwise improving the harbour at Douglas, was last week approved by the Manx Legislature, the right to carry out the work in sections being reserved.

The Reading Board of Guardians have adopted the plans prepared by Mr. W. Roland Howell, architect, for the enlargement of the workhouse. The scheme will cost 12,000*l.* By eight votes to seven it was decided that the tenders should be invited from Reading builders only.

Plans have been prepared for a new hotel in New York of twenty storeys high, and containing about 1,000 rooms. It will stand on the opposite end of the block on which stands the Waldorf-Astoria Hotel. The cost is calculated at 2,400,000*l.*

The Manchester education committee recommend the City Council to apply for a loan of 26,000*l.* for the erection of a school of domestic economy on a site at the corner of High Street and Upper Brook Street, which has already been purchased.

The Glasgow Corporation on the 17th inst. adopted a scheme prepared by Mr. A. B. M'Donald, the city engineer, for the demolition of the old property on the Bell Street and High Street area, and the erection thereon of buildings with shops on the ground floor, and fireproof warehouses on the upper floor. The cost is estimated at 28,000*l.*

The Governors of the Glasgow and West of Scotland Technical College have been officially informed that the Scottish Education Department have agreed to give a further grant of 37,305*l.* towards the cost of the completion of the building scheme with the necessary equipment, conditional upon the whole of the works being completed and equipment provided within three years. The total estimated expenditure towards which the grant could be made was 74,611*l.*

A Parliamentary White-paper has been issued showing the 1909 accounts for public offices and buildings. The principal items in the accounts are:—Public offices (Whitehall site), 1,228,827*l.*; Westminster site, 1,710,926*l.*; Science and Art Buildings, South Kensington, 827,360*l.*; completion of Admiralty, including extension, 303,734*l.*; Post Office buildings (Queen Victoria Street and West Kensington), 334,253*l.*; Patent Office extension, 86,433*l.*; British Museum extension, 47,150*l.* Each account includes expenses incurred before 1909.

A dispute between the Aberdeen operative painters and their employers regarding working hours has been settled by the Aberdeen Conciliation Board, to whom a reference was submitted by the parties. The operatives demanded a nine hours' days from April 1 to September 30, an eight hours' day during March and October, and a seven hours' day from November 1 to February 28. The Masters' Guild did not wish to be tied down to any stated times, and desired to leave matters as before. The Conciliation Board has decided that the operatives' demands are reasonable, and express satisfaction at the assurance of the representatives of the parties that in the application of this rule both parties would have reasonable regard to the exceptional circumstances in particular cases.

An attempt to revive interest in Elizabethan architecture is to be made at Olympia next month at the exhibition devoted to the Ideal Home, where the large annexe is to be transformed into a Tudor village with rustic shops ranged in picturesque fashion round the green. There will be the village stocks, the forge, the barber's shop, and the old inn; while close by the brook will fall in a cascade over rocks into the trout pool. To add to the verisimilitude all the occupants of the shops will be firms not less than 100 years old. The Tudor buildings will be historically accurate in every detail.

Some time ago a request was made to the Birmingham Corporation on behalf of the workmen employed in the building trades in the city that the working rules which by agreement between the masters and men govern those trades should be observed by the Corporation in relation to building trade operatives in municipal employment. A joint committee of representatives of the labour-employing committees of the City Council was appointed to consider the matter, and subsequently the various departments were requested to report as to how they would be affected by the adoption of the rules. The reports show that the whole of the departments were unable to agree to the adoption of the proposals in their entirety, and arrangements were therefore made for the partial application of the rules by the Corporation committees.

## INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

This Society held its usual monthly meeting on Thursday, the 17th inst., at the Society's house, 7 Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. There were also present the Revs. Canon J. Erskine Clarke, H. B. Coward, W. B. L. Hopkins, A. G. Ingram, G. Miller, C. F. Nolloth, G. Pole-Carew, Canon Edgar Sheppard, C.V.O., D.D., Canon H. E. Trotter, and the Master of Magdalene College, Cambridge, Sir William E. M. Tomlinson, Bart., Lieut.-Col. the Hon. G. H. W. Windsor Clive, the Hon. E. P. Thesiger, C.B., Colonel W. F. Tipping, Messrs. George Cowell, W. S. de Winton, E. Lee-Warner, H. W. Mozley, C. K. Norman, J. E. Ollivant, J. C. Powell, L. C. Wakefield and Lewis Wigram.

Grants of money were made in aid of the following objects, namely, building new churches at Birmingham, St. Basil, 130*l.*; Birmingham, St. Benedict, 235*l.*; Beltinge, St. Bartholomew, Kent, 130*l.*; Longton, St. Chad, Staffs., 225*l.*; and Southend-on-Sea, St. Erkenwald, 200*l.*; rebuilding the church of St. Paul, King Cross, Halifax, 250*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Aldrington, St. Philip, Sussex, 100*l.*; Dymchurch, St. Peter and St. Paul, Kent, 25*l.*; Hackney Wick, St. Mary-of-Eton, Middlesex, 75*l.*; Stocklinch, St. Mary Ottersay, Somerset, 15*l.*; and Walpole, St. Peter, Norfolk, 20*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Caergeiliog, near Holyhead, 5*l.*, making in all 20*l.*; Dockenfield, Frensham, Surrey, 35*l.*; Holloway, St. Padarn's Welsh church, Middlesex, 40*l.*; and Litherland, St. Andrew, near Liverpool, 40*l.* The following grants were also paid for works completed:—Southolt, St. Margaret, Suffolk, 15*l.*; Haslington, St. Matthew, Cheshire, 50*l.*; South Perrott, St. Mary, Dorset, 40*l.*; Little Fransham, St. Mary, Norfolk, 15*l.*; Cann, St. Rumbold, Dorset, 15*l.*; Smithfield, Wrexham, Denbigh, 30*l.*; and Fazakerley, St. Nathaniel, Liverpool, 25*l.* In addition to this the sum of 300*l.* was paid towards the repairs of twenty-five churches from trust funds held by the Society.

At this meeting the Rev. T. T. Norgate, F.R.G.S., F.R.Hist.S., secretary of the Clergy Friendly Society, was appointed secretary of this Society to fill the vacancy caused by the recent death of Mr. Joseph Monday.

## COAL v. GAS FIRES.

The Corporation of Glasgow have within the past few months been entering very energetically upon an air purification and anti-smoke crusade. In this connection a valuable report has been prepared on the effect on the atmosphere of the use of gas stoves in dwelling houses by the Corporation chemist (Mr. F. W. Harris), the sanitary inspector (Mr. Peter Fyfe), and the engineer of the Gas Department (Mr. A. Wilson). The tenancy was secured during six months of two dwelling-houses of equal dimensions in all respects and identical as to situation. They were ordinary houses of two rooms and kitchen, on the same flat.

The experiment was conducted on the following lines:—A gas fire was ignited and a coal fire kindled simultaneously in two different rooms, both identical in regard to situation and structural details. Galvanometer readings were taken every ten minutes throughout a period of six hours from 10 A.M. to 4 P.M. The thermopile was placed at the point of maximum intensity on the semi-circle, which point was found to be the centre, at a height of 1 foot both for gas and coal fires. The coal combustion was regulated according to the usual domestic practice—the fire gradually developing into a bright, clear combustion, then allowed to burn itself somewhat low before replenishing with a fresh supply of coal. Experiments were made on two days with different gas fires. Gas fire No. 4 consumed 29.7 cubic feet per hour at a pressure of 16 tenths, whilst the consumpt of gas fire No. 6 was higher, namely, 33 cubic feet per hour at a pressure of 16 tenths.

The radiation efficiency of the gas fires tested, as indicated by the galvanometer readings taken at a height of 1 foot (the position of maximum intensity), and calculated to a standard of 100 cubic feet consumption of gas of a calorific power of 600 B.T.U., was expressed as follows:—No. 1 gas fire, 86; No. 2. 81; No. 3. 70; No. 4. 91; No. 5. 90; No. 6A, 135; No. 6B, 82; No. 7A, 120; No. 7B, 91. Nos. 6A and 6B represented the results of observations of the same fire burning different consumpts of gas. In the case of 7B four of the centre burners were turned off.

The great advantage of a coal fire from the point of view of comfort was that the heat imparted to a room was diffused in the form of radiant heat. The question naturally followed, how did the above figures, expressing the comparative radiation efficiency of various gas fires, compare with the figures obtained under similar conditions for coal fires? A reliable comparison of the radiation efficiency of gas fires was only rendered possible from the fact that the intensity of radiation became practically constant after a certain time. Experiments on similar lines to ascertain the radiation efficiency of coal fires speedily demonstrated that with coal fires the case was quite the reverse. The galvanometer readings fluctuated so rapidly and so widely that any attempt to record a series of readings with the object of calculating the same to a standard of definite coal consumpt and calorific value was rendered futile; in fact, such a record would be not only worthless, but actually misleading. A decision on the comparative heating efficiency of gas and coal depended so much on the comparative radiation efficiency of these fuels when burned under ordinary conditions that, for the purpose of this report, such a comparison becomes essential. If gas fire No. 6 was debarred from the comparison on account of its comparatively high radiation efficiency and gas consumpt and the consideration was limited to the results obtained with gas fire No. 4, whose comparative radiation efficiency was 91, it would be noticed—firstly, that the intensity of radiant heat emitted from a gas fire was very regular, whilst that from a coal fire was subject to extreme and rapid fluctuations; and, secondly, that the radiating powers of a gas fire were much more speedily developed than those of a coal fire. It was obvious that, given a modern, well-constructed gas fire, fitted with gas and air regulators, intelligently fixed and used, the radiation efficiency became a definite asset; whereas the corresponding efficiency of a coal fire, being dependent upon innumerable conditions, could not be designated otherwise than as an indefinite quantity. Another advantage that a gas fire possessed over a coal fire was that its radiation efficiency was to a certain extent under control, which was certainly not the case with a coal fire. The main point for consideration was the percentage of total heat generated by the combustion of gas in the different gas fires which was transmitted to the room in the form of convected heat. The following percentages were obtained:—

| | Percentage of total heat given off as convected heat. |
|---|---|
| Fire No. 1 | 7 |
| ,, ,, 2 | 19 |
| ,, ,, 3 | 13 |
| ,, ,, 4 | 23 |
| ,, ,, 5 | 10 |
| ,, ,, 6 | 16 |
| ,, ,, 7 | 29 |

The tabulated results for the convected heat from a coal fire showed that 2.3 per cent. of the total heat generated from the combustion of coal in an ordinary domestic fire was imparted to the room in the form of convected heat. The percentage of total heat generated and given off in the form of convected heat was therefore greater for gas fires than coal fires. Sufficient evidence was obtained to enable the assertion to be made that at least 75 per cent. of the total heat generated by the combustion of coal in an ordinary domestic fire was lost in the form of flue heat.

In regard to the hygienic efficiency of gas fires compared with coal fires, the report stated that it was an accepted fact that if the carbon-dioxide resulted entirely from respiration, then the proportion of this gas became a direct index of the polluted condition of the air, solely because the quantity of it found was in such cases in direct proportion to other products of respiration organic in nature and toxic in properties. The perfect combustion of coal gas yielded no toxic compounds, and therefore considerably more latitude was permissible in regard to the proportion of carbon-dioxide when a portion of that gas had been derived from combustion. This principle had been adopted by the departmental committee on the ventilation of factories and workshops in deciding upon a legal limit for carbon-dioxide. Another point of considerable importance was that the tests for carbon-dioxide were made after the fires had been burning six hours, so that the reporters could not be accused of putting forward results too favourable to gas fires; on the contrary, the reverse was the case. There could, however, be no doubt that this proportion of carbon-dioxide, due to gas combustion found in the air of a room, was incapable of producing any injurious physiological effect. Coal fire experiments on similar lines were made, and it was found that under normal conditions of chimney draught no waste products, either of complete or incomplete combustion, were bye-passed into the room, whilst the carbon-dioxide content of the air in the room was not materially increased. These results would occasion no surprise when it was stated that the average flow of chimney gases was in the case of coal fires not less than 17,500 cubic feet per hour, which was equivalent to changing the air of a room ten times every hour. Gas fires were equally efficient as ventilating mediums as coal fires, for although only in one case was the volume of waste gases passing up the flue per hour found to approach that of coal fires, yet such an outgoing volume as 17,500 cubic feet was altogether unnecessary. The common objection to gas fires—namely, that they caused undue dryness of the air—was not based upon fact; on the contrary, experiments unmistakably demonstrated that gas fires exerted no more drying effect on the air of rooms than ordinary coal fires.

The total expenditures for the six hours' trial were:—For gas, 4.2912*d.*; and for coal, 2.9062*d.*, or 1.385*d.* in favour of coal. If the price of gas were 16*d.* per 1,000 cubic feet instead of 24*d.*, the cost of these two fires would have been identical, with a manifest advantage from the gas fire in rapid, evenly, and progressive heating power to the maximum and an instantaneous extinction when no longer required. But even with an extra $1\frac{1}{3}$*d.* gas could claim a convenience and simplicity of regulation impossible with coal; a rapidity of effect which coal fires could not attain to; and an absence of dirt and dust and ashes which might easily compensate every cleanly housewife for the fractional saving she could make in money by burning coal. The reporters were therefore of opinion that, even when fires were required for continuous daily use, if gas was burned in properly constructed grates or stoves, and the cost of service for attending coal fires, and the extra work entailed in dusting, sweeping, and washing because of them, were added to the price of the fuel, the cost of heating by gas compared very favourably with the cost of heating by coal. Where domestic cooking alone was the consideration, or when rooms required to be rapidly heated and kept at an even temperature for short periods, gas fires were not only more convenient, but would cost less than coal fires even with gas at its present price.

In regard to the effects a more general adoption of gas firing in dwelling-houses and other occupied premises would have on the atmosphere of the city, the report stated that the perfect combustion of either gas or coal yielded products chemically identical, differing only in the proportion in which they were produced. The perfect combustion of a fuel necessitated that the temperature of the fuel and its products must be maintained at or above their ignition point, whilst at the same time each particle of fuel must be brought into contact with an adequate supply of air. By the employment of a gaseous fuel, such as coal gas, these conditions were easily secured, and required only the intelligent use of a modern gas fire or stove. On the other hand, the perfect combustion of coal in an ordinary domestic grate was an impossibility as the two essential conditions for perfect combustion could only be imperfectly fulfilled. The reporters were therefore confronted with the fact that the atmosphere was constantly being vitiated with the discharge from domestic chimneys of the visible and invisible products of the incomplete combustion of coal. The general conception of smoke and its composition was that it consisted almost entirely of finely divided particles of unconsumed carbon, and that the obnoxious qualities of smoke were proportional to its density and colour. That was incorrect. Smoke was a body of great complexity, its composition depending not only on the nature of the substance burned, but on the temperature prevailing during the formation of the smoke. The chimney gases from a coal fire contained averagely 13.58 lb. of solid matter per million cubic feet, whilst the chimney gases from a gas fire were entirely devoid of any trace of solid matter. In order to impart to the lay mind a practical conception of what the 13.58 lb. per million cubic feet meant, it was explained that this quantity was equivalent to fully 5 per cent. of the coal consumed.

The reporters conclude by stating that they feel assured that after a careful study of their facts and figures the citizens will readily acknowledge that the smoke-producing, wasteful domestic coal fire must be replaced by the more cleanly, evenly, and healthy gas fire before we can hope to obtain a purer atmosphere or even begin in earnest with the work of air purification.

EIGHTEEN Belgians landed at Leith last week from Antwerp en route for Skye, where they are to be engaged in marble cutting by the Skye Marble Company. They are stated to be more highly skilled than the home workers in the cutting of the fine white marble to be found on that island.

## EASTER HOLIDAY ARRANGEMENTS.

EXCEPTIONAL facilities for spending Easter in the country or by the sea are announced by the London and South Western Railway Company.

The novel experiment of running express trains from London to Bournemouth every half-hour on the Thursday before Easter proved such a success last year that the arrangements will be repeated for the coming holiday, and between 1.20 and 8.20 P.M. on Thursday, March 24, all trains for Bournemouth will start from the new South station at Waterloo, which will be reserved for Bournemouth passengers only during the time the "half-hourly" service is running. Ordinary and "week-end" tickets will be issued by these trains; also by special express from Waterloo to Bournemouth and the New Forest on Good Friday morning at 10.15.

There will also be special trains and cheap tickets to other resorts in the Sunny South and South-West, including the Isle of Wight, Southsea, Lee-on-the-Solent, Southampton, Swanage, Weymouth, Lyme Regis, &c.

Many will doubtless be travelling "in the path of the sun" to the West, and for such additional corridor trains will be run from Waterloo, including a special dining-car express at 7 P.M. on Thursday, March 24, to Ilfracombe, Bideford, Barnstaple, Exeter, Exmouth, Okehampton (for Dartmoor), Tavistock, Bude, Launceston, Padstow and other places in Devon and Cornwall. Cheap excursion tickets will be issued to these parts, by special trains leaving Waterloo on Thursday morning and midnight.

Week-end tickets will have extended availability from Thursday to Tuesday, and be issued by all trains.

Beautiful Brittany, the "Land of Pardons," with its interesting festivals, is most attractive at this time of the year, and the 24*s.* 6*d.* trips from Waterloo, via Southampton, to St. Malo on the Thursday and Saturday before Easter allow of a long or short stay, as desired, being available for return any day of sailing within fourteen days.

Similar bookings are announced to Normandy (Cherbourg 23*s.* 6*d.*, and Havre 24*s.* 6*d.*); also to Paris 26*s.*, Guernsey and Jersey 22*s.*

On Easter Monday a corridor express half-day excursion will leave Waterloo 11.30 a.m. for Weymouth, Swanage, &c., at return fare of 4*s.* 3*d.* A refreshment-car will run in the train. Other trips will be run to the seaside and riverside places.

Programmes giving full particulars, obtainable at the Company's London offices, stations, &c., or from Mr. Henry Holmes, superintendent of the line, Waterloo Station, S.E.

## THE BUILDING TRADE IN QUEENSLAND.

THE facts gleaned in regard to the subject go to show (according to a correspondent) that the past year has been one of the most prosperous yet recorded in the building trade, not only in Brisbane, the capital of Queensland, but in many of the other leading centres. The number of new buildings erected and in course of erection has never been greater. Every one of the leading architects at Brisbane who has been spoken to on the subject has said unhesitatingly that the year has been absolutely the best experienced. It was not alone dwelling-houses which were being built, but warehouses, stores, villas, butter factories, shops, and every other kind of premises were going up with a rush. In the country as well as the town the same thing was observable, and as a matter of fact the consensus of opinion appeared to be that in country towns and country districts more building was being done than had ever taken place before. It would be impossible to give a record of all the work and all the buildings which have been erected in the city during the past year, but as an instance it may be mentioned that one architect said that he had in one week in October last received commissions exceeding 60,000*l.* One matter which struck this gentleman very forcibly was that he could not get the same amount of competition for work offering. It was impossible, he said, to get the same number of tenders as had formerly been obtained. He had repeatedly offered private tenders for 1,500*l.* or 2,000*l.* to men and had them refused; the men were all too busy to take them on. Two or three years ago the same men would have tumbled over each other to get them. So much can be said for the state of the building trade generally at the present time, and with regard to the future no diminution in the demand for new premises is expected. According to a Brisbane contemporary the building trade is "flourishing like a green bay tree, and what is more, it will keep on flourishing for some time to come."

## ILLUMINATING ENGINEERING SOCIETY.

A meeting of this Society was held on Tuesday evening, the 15th inst., at the house of the Royal Society of Arts, Professor Silvanus P. Thompson (President) in the chair, when a discussion took place on "Recent Developments in the Measurement of Light and Illumination."

The **President** said he had been asked to open the discussion by certain very brief remarks and the exhibition of some simple and rough pieces of apparatus. He would therefore begin with the methods rather than the results of photometry; the latter were to be considered at their next meeting. The whole art, so far as it was an art, rests on the shifting of something or other—varying the distances of two sources of light from a screen until there was equality of illumination on the two halves. The developments after that became a science and not an art. They had need too for standards in photometry. The candle which was the standard in Germany was a particularly little lamp. The English candle was too unreliable and there were various others which failed. The best was the Harcourt Pentane lamp. One of the oldest ways for getting illumination for the purpose of photometry was Ritchie's, another Rumford's, and then there was Trotter's. An extremely excellent photometer could be made with two blocks of paraffin wax placed face to face with a leaf of tinfoil interposed between the two. That was Joly's photometer, and it was one of the simplest and one of the best. One of the worst was the Bunsen grease-spot. Then there was the Lummer-Brodhun prism photometer, and lastly the principle introduced by Rhode for judging the illumination of lights of different heights by the flicker of reflected light upon a divided screen; when both halves were equally bright a standard could be formulated.

Professor A. G. **Vernon Harcourt**, M.A., F.R.S., &c., said the comparison of lights of different colours had been estimated in various ways. There was Sir William Abney's plan, which gave good results by the rapid movement of red and blue lights at short intervals. Professor Harcourt went on to describe some official experiments he had made at the South Foreland some years ago on the amount of light given by different illuminants for use in lighthouses.

Professor **Fleming** referred to primary and secondary standards of light, and said that although an immense amount of labour had been spent in trying to obtain them, the light varied in a most marked degree in all standards. He advocated a universal standard and urged that some of the resources and funds of our great national institutions should contribute towards experiments for solving the problems.

Mr. A. P. **Trotter** dealt with the question of experimental facilities at technical colleges and scientific institutions for the study of photometry. When he was preparing to write, he said, a series of articles some two years ago on the subject, he had not been engaged in photometry for about eighteen years, and so he visited establishments of three kinds to see what was being done in photometry. Engineering rooms, lamp manufacturers' works, and the laboratories of technical colleges amazed him by their antiquated and limited material. The teaching of photometry he knew made two classes, the science and the art, and in the technical colleges it fell between physics and engineering, and it was likely to lose its place if more care was not taken in photometrical instruction. In the laboratories which he had seen there was either apparatus twenty, thirty, or forty years out of date, or else they had the most expensive and highly accurate kind, and nothing between it and the old-fashioned. Physics as a branch of photometry was lamentably treated. He did not know of a single textbook in the English language in which the Bunsen photometer was described accurately. From the educational point of view photometry could be divided into two sections, the elementary and the practical laboratory work, which was a fascinating art.

Mr. **Pattison**, of the National Physical Laboratory, said though the Pentane lamp had been criticised rather severely, for the present it served well as a temporary standard and would take a very great deal of beating. They could reduce it to an accuracy of 0.1 per cent., and he thought therefore it compared very favourably with other standards. The suggestion had been made that Professor Violle's should be followed up. It had been, he said, their intention at the National Laboratory to do so, but he felt the colour of the light would be a great difficulty to overcome. For a reliable electric standard they must get it in terms with other lights. In experimenting on the colour it seemed to him that they were face to face with some physiological problem. For as one man will see a red light better than a blue, and another man a blue light better than a red, it was necessary that the colour should be based fundamentally on some form of average value. It was possible to attack the problem though a number of divisions might be the result, for in that way they could obtain a calibration.

Professor **Sampner** dealt with No. 3 of the queries prepared for discussion at the meeting which was as follows:—"What are the best modern methods of obtaining the polar curves of light distribution and of measuring the mean spherical candle-power of different sources, and what possibilities are there of simplifying and improving such processes in the future? What are the best methods of deriving the mean spherical or mean hemispherical candle-power from such curves in the case of all illuminants?" The question, he said, seemed to divide itself into two parts. With reference to arc and glow lamps the general law of distribution had been worked out, but practically it was a very difficult matter to get a mean spherical candle-power. As regarded arc lamps it was altogether different. In such cases they had to deal with a distribution which varied in a very complicated way, and they were also working with an illuminant which was not constant itself. Although elaborate methods had been devised for measuring the candle-power of arc lamps in different directions, the speaker ventured to think that many people had not worked out the problems because the experiments were of an extensive kind, and they found they were testing something which was not constant.

Mr. **Liberty** said they had heard descriptions of, and seen many and sundry photometers, but they still felt doubtful of their accuracy. He, for one, he said, was looking forward to the time when they could have some national standard of photometry, even as they were hopeful of obtaining an international standard of light. All standards seemed confusing, and it was the same with the photometer. To his mind the best kind of photometer they could have was the flicker.

Professor **Morris** said various photometers had been spoken about during the evening, and he wished to say that from his own experience, working with the grease spot photometer was as satisfactory as with many others. The grease spot must be well made, perhaps they would need to make thirty or forty attempts at it to have a good one. Then he believed it was best to work with an exceedingly small spot, and after removing the coating of grease to slightly heat the paper. He would have been glad if the absorption of globes had been dealt with for it was not easy to gauge the amount of light a globe would absorb.

Mr. J. S. **Dow** said the light which gave the brightest illumination was not necessarily the best as a standard.

The **President**, in concluding the proceedings, said one point had come out as a result of the meeting, and it was that the subject was very much too vast for one evening's discussion or even for two. They had begun work on an enormous field, he would not say it was unexplored, but it had not been worked out by any other society, and for that reason alone they found there was justification for such a society as their own. Perhaps it was well that in their first year they should be dealing wholesale with such big problems, for in the next session they could get down to details, and perhaps after that to papers and lectures.

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The French Government is proceeding with the gradual abolition of the use of white lead. According to the *Revue Syndicaliste*, its use as a basis for paints—and practically all housepainting is done in lead-paints—is prohibited by a measure which has recently been passing between the Chamber of Deputies and the Senate. The last difficulty to be overcome was the question of compensation to the makers of white lead. The Chamber refused any indemnity to the manufacturers of "murderous products," but the Senate on the contrary defended the manufacturers and maintained the principle of compensation. Two Commissions were appointed representing the Chamber and the Senate. They met and have come to an agreement. The majority of the Commission of the Senate abandoned the principle of compensation, and were satisfied with a postponement of the date after which the prohibition was to come into force. To this delay the Chamber agreed. The essence of the agreement is that in five years after the promulgation of the law the use of white lead shall be prohibited in the painting of buildings, both of the exterior and the interior. Inspectors are charged with seeing that the law is observed. The penalties for infraction are to be those in the Workshops Health Act of 1893.

## THE LE CHATELIER BOILING TEST OF CEMENT.

THE Concrete Institute held their eighth ordinary general meeting at the Royal United Service Institution, Whitehall, S.W., on March 17, when Mr. D. B. Butler, A.M.Inst.C.E., F.C.S., read a paper entitled "Notes on the Le Chatelier Boiling Test of Portland Cement."

The soundness of Portland cement—*i.e.*, its freedom from expansion ("invariabilité de volume" or "volumenbeständigkeit," to give its French and German equivalents respectively)—the author thought, was its most essential property, and should be always the first thing to be determined in estimating the constructive value of a sample. It was obvious that, notwithstanding other highly desirable qualities which a cement might possess, such as great strength or large sand-carrying capacity, if it was unsound, and contained certain elements which subsequently caused expansion, with, in extreme cases, disintegration and crumbling, it was not only of no use as a constructive material, but was at once converted into a destructive material. Although with the improved methods of manufacture obtaining of recent years these extreme cases of disintegration had become more and more rare, expansion of a more or less dangerous nature was not infrequently met with.

The original test for soundness, the author explained, was based more or less on working conditions—*i.e.*, pats or cakes of neat cement, plunged into cold water when set, or after twenty-four hours in air, and examined at intervals; if at the end of a month they showed no signs of cracking or distortion, and adhered firmly to the glass plate on which they were made, the cement was considered satisfactory as regards soundness. This test laboured under the obvious disadvantage that twenty-eight days had to elapse before a definite opinion could be pronounced, and the cement finally accepted for use, a delay that was frequently impossible in practice, although it might be argued that the generally specified twenty-eight days' tensile tests laboured under the same disadvantage.

To obviate this long delay several accelerated tests for soundness have been evolved from time to time. About thirty years ago the late Henry Faija introduced a test for soundness, consisting in subjecting cement pats to seven hours in moist air of 110° Fahr. followed by seventeen hours in warm water of 120° Fahr., which enabled an opinion to be formed in twenty-four hours instead of having to wait twenty-eight days as formerly.

The next accelerated test was that of M. Deval, brought out about ten years later; after twenty-four hours in air or under a damp cloth at ordinary testing-room temperature, and two days in water of 176° Fahr., the strength developed was supposed to be comparable with that of one day air +6 days in ordinary cold water; while after a further four days in hot water, *i.e.*, one day in air and six days in hot water, the strength developed was supposed to be comparable with one day air +27 days' cold water.

### *The Boiling Test.*

From the 176° Fahr. of the Deval test it was but a step to the boiling test now in vogue, and having regard to the difficulty of always maintaining an equable temperature of 176° Fahr., the boiling test is certainly considerably simpler; the ordinary qualitative boiling test consisted of allowing a pat to set twenty-four hours in a damp box of 60° Fahr., and then placing it in cold water, which was gradually raised to boiling and maintained at that temperature for six hours, after which treatment the pat should show no signs of warping or cracking; it was sometimes further specified that the edges of the pat should also break off with a sharp crisp ring, which was a very sure indication that it was free from cracks or flaws of any kind.

The foregoing tests were all of a qualitative order, and depended more or less on the personal experience of the operator, as to whether the results obtained were seriously defective or not.

### *Bauschinger Apparatus.*

The most accurate quantitative method of measuring expansion or contraction, whether in air, cold water, or by the various accelerated tests, was the Bauschinger micrometer calliper apparatus, in which the test pieces consisted of prisms or square bars 100 mm. long and 22 mm. by 22 mm. cross-section; the delicacy of the instrument was such that variations in the length of the bar to within $\frac{1}{200}$ mm., or 0.005 per cent. could be determined with certainty. It, however, required very careful expert handling, and was somewhat expensive, the equipment including moulds, costing about 12*l*.

### *The Le Chatelier Test.*

The only other quantitative method of note for determining expansion was that devised by M. Le Chatelier, which was adopted by the British Standards Committee in 1904 as the standard method of determining the soundness of cement. The description and method of working, taken from the revised British Standard Specification of 1907, was as follows:—

"The cement shall be tested by the Le Chatelier method, and shall in no case show a greater expansion than ten millimetres after twenty-four hours' aeration and five millimetres after seven days' aeration.

"The apparatus for conducting the Le Chatelier test consists of a small split cylinder of spring brass or other suitable metal of 0.5 millimetre (0.0197 inch) in thickness, forming a mould thirty millimetres ($1\frac{3}{16}$ inches) internal diameter and thirty millimetres high. On either side of the split are attached two indicators with pointed ends, the distance from these ends to the centre of the cylinder being 165 millimetres ($6\frac{1}{2}$ inches).

"In conducting the test, the mould is to be placed upon a small piece of glass and filled with cement gauged in the usual way, care being taken to keep the edges of the mould gently together while this operation is being performed. The mould is then to be covered with another glass plate, a small weight is to be placed on this, and the mould is then to be immediately placed in water at a temperature of 58° to 64° Fahr., and left there for twenty-four hours.

"The distance separating the indicator points is then to be measured, and the mould placed in cold water, which is to be brought to boiling-point in fifteen to thirty minutes, and kept boiling for six hours. After cooling, the distance between the points is again to be measured; the difference between the two measurements represents the expansion of the cement, which must not exceed the limits laid down in this specification."

It certainly had this advantage over the Bauschinger apparatus, that it was cheap and simple, and involved no costly apparatus, but whether it was equally accurate was quite open to discussion. In the course of ordinary professional testing work, the author stated he had had to carry out many thousands of tests for soundness by the Le Chatelier method, and the conflicting results he had sometimes obtained had led him to the conclusion that where the condemnation of a cement for unsoundness was concerned, the results given by the Le Chatelier test should not be too rigidly interpreted.

The author then quoted series of experiments to show the variable results which might be obtained by different operators, and even by the same operator working under exactly the same conditions.

In order to ascertain if differences in the elasticity of the moulds were in any way responsible for the variable results obtained, the author devised a special apparatus. The variation given by different moulds was considerable. However, the results did not definitely point to differences in the elasticity of the mould as being responsible for the variable results obtained, since No. 10, which was an extremely weak mould, gave the least expansion in two cases out of three.

It was thought possible that the position of the test pieces in the boiling bath, whether in the centre or round the outside, might have had something to do with the variations found, and tests were therefore made to ascertain if this were so, but the results suggested that this was not the case. Nor did variations in time of cooling after boiling appear to affect the result in any way.

### *Differences due to Aeration.*

Another curious feature about the Le Chatelier test was that instances were very frequently met with in which the expansion was considerably greater after six days' aeration of the sample than when first received, or after only twenty-four hours' aeration. From the point of view of a test for soundness this was an obvious absurdity, since it was a well known and thoroughly acknowledged fact that cement improved with aeration as regards soundness; it therefore very strongly suggested that the increased expansion of such samples upon boiling was due to causes altogether outside the question of soundness as it was generally understood, i.e., the presence of disruptive agencies within the cement itself, which would eventually cause expansion under ordinary working conditions.

### *Less Expansion on Boiling than in Cold Water.*

In a paper read before the Concrete Institute in May last on the setting properties, &c., of Portland cement, Mr. H. K. G. Bamber referred at considerable length to the Le Chatelier boiling test and raised one or two interesting points.

He first of all drew attention to the fact that the expansion of the specimen during the preliminary twenty-four hours' immersion in cold water was altogether ignored, only the subsequent expansion during boiling being taken into account, and pointed out that instances frequently occurred in which the expansion in cold water was considerable, whereas that resulting on boiling was negligible. The author of the present paper said he could fully bear out that statement, for it was the custom in his testing-room to record in every case the expansion caused by previous immersion in cold water, as well as after boiling, and in many cases, more especially with slow-setting cement, the expansion in cold water was very much more serious than that due to boiling.

Surely it was more important to record the expansion under actual working conditions in cold water than that produced by boiling, for whatever the value of boiling as an accelerated test for soundness, cement was rarely, if ever, subjected to boiling water in practice.

Mr. Bamber also referred to the somewhat arbitrary condition of only allowing the cement twenty-four hours to harden under water, before being subjected to the boiling water, and suggested that failure was frequently due to the cement, more especially the slowly hardening varieties, not having had time to sufficiently harden in that brief period to withstand boiling water.

Referring once more to Mr. Bamber's paper, he gave as one reason of cement sometimes failing to pass the Le Chatelier test, the inability of the coarse particles, or unpulverised clinker, to withstand boiling water without expansion, and expressed the opinion that "it has yet to be proved" that because such unpulverised material caused expansion when submitted to boiling water, that it would also cause expansion under ordinary working conditions in cold water. With this the author agreed, and quoted experiments which showed that there was something in the contention.

The experiments embodied in the paper, taken as a whole, appeared, the author suggested, to justify his remark at the commencement, that where the condemnation of a cement for unsoundness was concerned, the results given by the Le Chatelier boiling test should not be too rigidly interpreted. Apart from the mass of anomalies and conflicting results continually met with, it was quite an open question whether a cement should be condemned as unsound because it would not withstand boiling water twenty-four hours after gauging, whether that twenty-four hours' preliminary hardening was in cold water or in air.

Whatever excellent reasons there might be for or against accelerated tests, the author could vouch from personal experience for the fact that considerably less than twenty years ago not 10 per cent. of the Portland cement manufactured in England or elsewhere would withstand boiling water under the foregoing conditions; the obvious inference, therefore, was that if such was a true test for soundness, 90 per cent. of the cement used twenty years ago was unsound. This, in view of the hundreds of thousands of tons then used for important engineering work throughout the world, was rather a startling proposition; and having regard to the excellent condition of such work at the present time, was one that could scarcely be seriously maintained.

Mr. Bertram Blount in opening the discussion from the chair, remarked that the paper was admirable for its contents, for the labour involved, and for its perfect lucidity and impartiality. But at the same time he thought the author had supposed that because certain nations had failed to prepare the same admirable qualities of cement as were to be obtained in this country therefore we should all set back the hands of the clock and revert to discarded methods of testing. With this he thoroughly disagreed.

Mr. H. K. G. Bamber believed that Mr. Butler had rendered a conspicuous service not only to the engineering profession, but also to the cement trade in raising any question which would tend to elucidate this difficult subject. Mr. Butler had dealt with his subject from a comparative point of view in as much as he described various tests for the soundness of cement. The Faija test had fallen somewhat out of use by reason of the fact that the manufacturers knew that if any slab failed to pass that test it must be very bad indeed. Mr. Bamber stated that he himself looked upon the Deval test as one of the most important, and if any cement for which he was responsible could pass that test he knew he had no cause for sleepless nights. This test was the most satisfactory from the manufacturers' point of view. The Le Chatelier test had been correctly described as a cheap and simple one. It was also true that the results obtained by it should not be too rigidly interpreted; in practice experts did not draw a very hard and fast line in the matter. M. Le Chatelier had since suggested that the test should be modified so as to cover the expansion of the specimen during the preliminary twenty-four hours' immersion in cold water, instead of only the subsequent expansion during boiling being taken into account. Mr. Bamber believed the point should be dealt with as he was firmly of opinion that a cement which expands considerably in cold water is much more dangerous than one which only expands in hot water. As to the severity of the test there could be no doubt that the engineering profession would at any rate come to the conclusion that it was preferable to have a test that was unnecessarily severe than one which was not strict enough. It would be most regrettable if they fell back on tests common twenty years ago.

Mr. Cooper thought that the paper was built up on a false foundation. The Le Chatelier test was by no means invariably to be relied on, and if a sample of cement failed to comply with it there was no reason for concluding in consequence that it was unsound. One objection to it was that no matter whether the cement was slow or quick setting it was boiled for an arbitrary period. It was largely admitted that cement which is spread out and aerated is improved thereby in soundness. But experience showed at the same time that cement not infrequently gets worse after aeration—at least it does if judged by the test in question.

Mr. Gordon Nicol, engineer to the Aberdeen Harbour Board, said that the paper dealt with a subject of the utmost importance to the engineering profession, because if there was one quality in cement that was essential to an engineer it was that of soundness. Aberdeen, where he came from, enjoyed perhaps a rather unhappy reputation for failures in cement; but these perhaps were due to other characteristics than to any unsoundness in the material employed. To the engineer some form of test for soundness was a sine quâ non; he has to anchor his faith to it once he has received an assurance that it has been passed after testing. Mr. Nicol said that for the past sixteen years he had carried out the boiling test very rigidly, indeed rather more severely than most people, and his impression was that in a comparatively short period a faulty cement may escape detection, whereas in a longer period it would be detected. It might be argued that the test was a too severe one; but none the less manufacturers are able to undergo it. Until engineers had discovered a more reliable one, they would like to be assured by the method now adopted that the cement was sound. He had used the Le Chatelier test for some time so as to comply with the requirements of the British Standard Specification of 1907, but it was on the longer period that he determined whether the cement was suitable or otherwise. A severe test for soundness was that of breaking the briquettes after boiling and comparing them with samples that had not been boiled. The accelerated test is one that should be used not only to show the acceleration of defects but also the acceleration of strength. Mr. Nicol concluded by saying that until they got a test that would satisfy the user of cement as to its soundness they would have to adhere to the boiling test.

Mr. C. H. Watson said his own recent experience combined with some of the figures which Mr. Butler had given in his paper would almost tend to shake one's confidence in the test; but such vagaries and eccentricities were quite capable of explanation. After having conducted these tests day after day, and seen so many results, he had come to the conclusion that they were not all to be taken dogmatically. The Le Chatelier test was not so emphatic that one could pass or reject cement on the showing of that alone. The results varied from many assignable causes. The Le Chatelier test, moreover, required to be carefully handled; in the hands of experts it was good enough, but when conducted by amateurs it produced extraordinary results. It was not one upon which cement should be accepted or rejected unless taken in conjunction with the British Standard Specification.

Mr. Lawrence Gadd and Mr, Plaister having also spoken,

Mr. D. B. Butler replied. He said that he was by no means averse to progress; what he wanted was a test for soundness which would detect unsoundness. A test which condemned both sound and unsoundness indiscriminately could not be a good test. The Faija test was such that if the cement did not show expansion under it, it would not show expansion under any test. One of the speakers had urged that the boiling should continue for forty-eight hours; his own experience was that if the cement does not show expansion in six hours it would not show any at all.

Preliminary preparations for the erection of tinplate works of eight mills by Messrs. Richard Thomas & Co., Ltd., at Llanelly, are now well in hand.

THE

# Architect and Contract Reporter.

FRIDAY, APRIL 1, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

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*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

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## COMPETITIONS OPEN.

Birkenhead.—The Guardians invite architects residing within the limits of the Birkenhead Union to submit designs for a Children's Receiving Home. Premiums will be awarded for the three first designs. Mr. J. Carter, clerk, Poor Law Offices, Birkenhead.

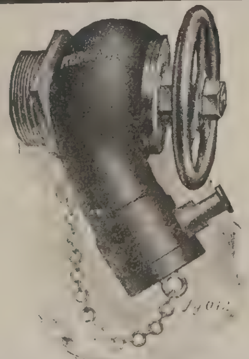
Ireland.—April 23.—The Meath County Council invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Apply to Mr. H. J. Cullen, Meath County Council Offices, Navan.

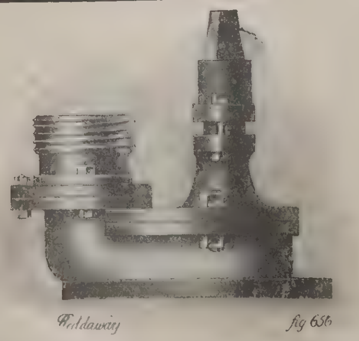
Liverpool.—The Corporation invite designs from architects practising in Liverpool for a branch library estimated to cost not more than 7,000*l.* Mr. W. E. Willink, F.R.I.B.A., will act as assessor. Apply to Mr. E. R. Pickmere, town clerk, Reference Library, William Brown Street, Liverpool.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

The consumption of electricity in Copenhagen is increasing at a very rapid rate, and a large alternating-current central station is to be built, as well as extensions to already existing stations. It is proposed that the new station shall have a capacity of 180,000 horse-power. At first, however, the plan only comprises the installation of three turbo-dynamos of 7,500 horse-power capacity each. The cost is calculated at about 340,000*l.*





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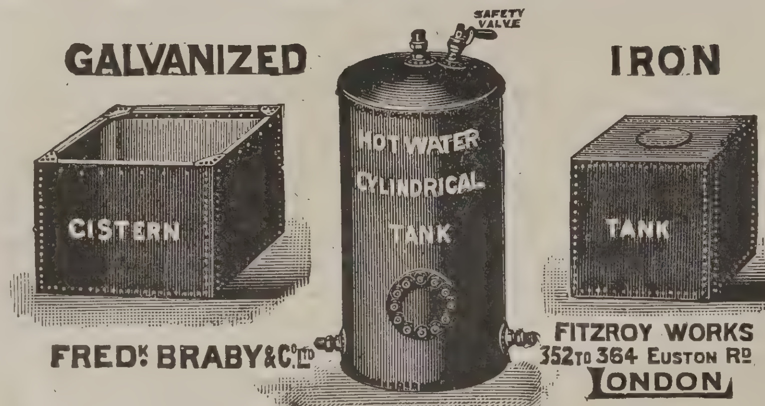

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Birmingham.—April 20.—For the erection of a fire station in Moseley Road, Highgate. Send 2*l.* 2*s.* deposit to the City Treasurer, Council House, Birmingham. Apply by April 8 to Messrs. Mansell & Mansell, 47 Temple Row, Birmingham.

Bootle (Lancs).—April 15.—For erection and completion of a public elementary Council school, in the south-east district of Bootle. Deposit 2*l.* 2*s.* Mr. J. Henry Farmer, town clerk, Bootle.

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Bristol.—April 5.—For erection of extensions to a cold storage warehouse in Jervis Street, Barton Hill. Mr. F. Bligh Bond, F.R.I.B.A., Star Life Buildings, St. Augustine's Parade, Bristol.

Bugle.—April 3.—For erection of concrete chapel at Bugle, Cornwall. Rev. J. T. Morris, Sunny Bank, Mount Charles, St. Austell.

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Cockermouth.—April 6.—For the various works required in erection of a house in Victoria Road. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

Codnor.—April 11.—For erection of Council school, Codnor, Derbyshire, to accommodate 120 infants. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A, architect to the committee, St. Mary's Gate, Derby.

Cove.—April 25.—For erection of a Council school for 140 children at Cove, near Farnborough. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Coventry.—April 8.—For erection of proposed building, Hill Top, Coventry, for the Triumph Cycle Co., Ltd. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry.

Durham.—April 12.—For new Council schools at Middleton St. George, Hartburn, and Whitton. Mr. W. Rushworth, Shire Hall, Durham. For alterations and improvements at Usworth Colliery, Littletown, and Consett cookery centre. Mr. F. E. Coats, Shire Hall, Durham.

Erith.—April 18.—For erection of two additional wards and other extensions to the Erith Sanatorium, Little Heath, Belvedere. Deposit 2*l.* 2*s.* Mr. Harold Hind, surveyor, Council Offices, Erith, Kent.

Farnborough.—April 9.—For the completion of the superstructure of the extension to workshops at the Army balloon factory, South Farnborough, in the Aldershot Command. Plans, specification, and conditions of contract may be inspected at the office of the Director of Barrack Construction, 80 Pall Mall, London, S.W., on April 6, 7, and 8. Deposit 10*s.* Apply by April 9 to the Director of Barrack Construction.

Featherstone (Yorks).—April 5.—For the several works in connection with alterations, folding screens and extending urinal at the Featherstone Provided school (boys), viz., builder, joiner, and plumber. Mr. Charles Harris, Education Offices, Knottingley.

Halifax.—April 4.—For additions to Ashfield, Burnley Road. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Hazel Grove.—April 19.—For erection of a public elementary Council school in Chapel Street, Hazel Grove, near Stockport, to accommodate 800 children, with housewifery, laundry, and cookery centres and caretaker's quarters. Deposit 2*l.* 2*s.* Mr. C. T. Adshead, architect, Leinster Chambers, 4 St. Ann's Square, Manchester.

Herne Bay.—April 13.—For the construction of a pier pavilion on the new pier extension. Mr. Percy J. Waldram, F.S.I., and Messrs. Moscrop-Young & Glanfield, architects, 12 Buckingham Street, Charing Cross, W.C. Send 1*l.* 1*s.* deposit by April 2 to Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

Hertford.—April 2.—For laying a new wood floor in the dining hall at the workhouse. The Master at the Workhouse, Hertford.

Heywood.—April 16.—For erection of an addition to the Heywood Technical School for a picture gallery and museum. Deposit 2*l.* Borough engineer, Mr. J. Ainsworth Settle, A.M.I.C.E., Municipal Buildings, Heywood, Lancs.

Heywood.—April 16.—For erection of an extension to the Heywood Technical School for day secondary school and other requirements. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Hull.—For erection of a detached villa residence in Newland Park. Deposit 2*l.* 2*s.* Send names to Messrs. Wellsted, Dosser & Wellsted, Waterloo Chambers, Hull.

Ireland.—April 16.—For the erection of a school at Philipstown, King's County. Rev. J. Bergin, P.P., the manager, Philipstown.

Isleworth.—April 9.—For erection of new schools and caretaker's cottage in Twickenham Road, Isleworth. Deposit 2*l.* 2*s.* Mr. J. G. Carey, architect and surveyor, Council House, Hounslow.

Leytonstone.—April 29.—For erection of a county high school for 300 girls, to be erected at Forest Road, Leytonstone, Essex. Deposit 5*l.* Send names by April 11. Mr. W. Jacques, A.R.I.B.A., architect, 2 Fen Court, Fenchurch Street, London, E.C.

Lincoln.—April 11.—For the construction of a brick and stone tower, 108 feet high to T.W.L., to support a spherical bottomed steel tank, containing over 300,000 gallons of water, and subsidiary works at Westgate, Lincoln, for the Corporation. Deposit 5*l.* 5*s.* with the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

London.—April 4.—For the construction of a new quay wall at the Council's Department, Peckham Park Road, Old Kent Road, S.E. The Borough Engineer's Office, Town Hall, Camberwell, S.E.

London.—April 5.—For the filling in to sides of corridor and covered way to temporary classrooms, Lordship Lane school, for the Wood Green Urban District Council. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green, N.

London.—April 7.—For the reconstruction of part of drainage and alterations to and addition of new w.c.'s on the women's side of Newington Workhouse, Westmoreland Road, Walworth, S.E. Deposit 2*l.* 2*s.* Mr. A. W. Tribe, architect, 120 Clapham Road, S.W.

Lower Sandhurst.—April 16.—For the enlargement of the Council school at Lower Sandhurst, Berks., by three class-rooms. Deposit 2*l.* 2*s.* Send names by April 2 to the Secretary to the Berkshire Education Committee, Market Place, Reading.

Nafferton.—April 7.—For erection of six cottages, at Nafferton, Yorks. Mr. Joseph Shepherdson, architect, 91 Middle Street South, Driffield.

Nuneaton.—April 8.—For erection of additional buildings at the Electricity Works, Coton Road. Mr. S. Cameron Gibson, borough electrical engineer.

Plymouth.—April 2.—For alterations to the Golden Lion, Old Town Street, Plymouth. Mr. F. A. Clark, architect, 83 Old Town Street, Plymouth.

Portsmouth.—April 5.—For repairs to the roof, ceilings, and decorations of the Masonic Hall, Highbury Street. Messrs. Rake & Cogswell, architects, Prudential Buildings, Portsmouth.

Risehow.—April 7.—For the several works required in erection of office, laboratory, storehouse, and smith's shop at Risehow, Maryport. Mr. John Henney, architect and surveyor, 29 Senhouse Street, Maryport.

Scotland.—April 4.—For the mason, carpenter, slater, plasterer, plumber, and painter and glazier works of semi-detached cottages to be erected in Ianstown. Mr. William Hendry, architect, Buckie.

Scotland.—April 4.—For the carpenter, plumber, plasterer, slater, and painter and glazier works of new laundry and cookery rooms at Inverurie, for the Inverurie School Board. Mr. George Gray, architect, Inverurie.

Scotland.—April 4.—For alterations at Hamilton Post Office, for the Commissioners of H.M. Works and Public Buildings. The Post Office, Hamilton, and H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—April 6.—For the front mason, back mason, joiner, shop-fitter, plumber, plasterer, asphalte, iron, glazier, and painter works and alterations on and additions to business premises, High Street, Cowdenbeath, for the Cowdenbeath Co-operative Society, Ltd. Mr. William Birrell, architect and surveyor, 214 High Street, Kirkcaldy.

Sheffield.—April 2.—For work to be done in erection of school buildings, &c., Psalter Lane, Sheffield, for the committee of the Boys' Charity School. Messrs. Gibbs, Flockton & Teather, architects, 15 St. James's Row, Sheffield.

Skipton.—April 6.—For the pulling down of a stone chimney, 135 feet high, together with other buildings, and also for erection of a new turbine house on the site at Belle Vue Mills. Mr. James Hartley, architect, Skipton.

Smalley.—April 5.—For erection of infant school for ninety children, for the Governors of Richardson's School Foundation. Mr. H. H. Dix, Clerk to the Governors, Smalley, Derby.

Somerset.—April 12.—For taking down and rebuilding retaining walls and general repairs at the following bridges, for the Somerset County Council:—(*a*) Nettle Bridge, at Oakhill, on the main road from Shepton Mallet to Bath; (*b*) East Chelwood bridge and West Chelwood bridge, on the main road from Bath to Weston-super-Mare, near Pensford, Bristol. Mr. H. T. Chapman, county surveyor, Bath.

Southampton.—April 5.—For the erection of a four-cell refuse destructor and Lancashire boiler, and the construction of foundations and other works incidental thereto. Deposit 1*l.* 1*s.* The Borough Engineer, Municipal Offices, Southampton.

Southampton.—April 8.—For erection of certain buildings at the platform, Southampton, and other works appertaining thereto, for the Harbour Board. Mr. E. Cooper Poole, A.M.I.C.E., engineer to the Board, Town Quay, Southampton.

South Reddish, near Stockport.—April 5.—For erection of new branch premises at South Reddish, for the Stockport Industrial and Equitable Co-operative Society, Ltd. The Architect's Department, Co-operative Wholesale Society, Ltd., Balloon Street, Manchester.

Spitalgate (Lincs.).—April 12.—For pulling down and rebuilding cells with court-room at Spitalgate Police Station, Lincs. Deposit 2*l.* 2*s.* Mr. Jesse Clare, county architect, Sleaford.

The Lizard, Cornwall.—For the erection of a residence for Commander Alfred J. Coad, R.N.R. Mr. Edwin Turner, architect, Llewelyn Chambers, Llandudno.

Wales.—April 4.—For erection of stores at Abercarn (Mon.), for the Abercarn Urban District Council. Mr. J. Williams, engineer and surveyor, the Council Offices, Abercarn.

Wales.—April 4.—For repairs and painting work to Christ Church, Abergavenny. Mr. E. A. Johnson, F.R.I.B.A., architect, Abergavenny.

Wales.—April 5.—For the erection of an infants' school, with offices, &c., at Clarence Street, Mountain Ash. Deposit 2*l.* 2*s.* Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

Wales.—April 5.—For erection of head teacher's rooms at Abercanaid School, for the Merthyr Tydfil education committee. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—April 7.—For the extension of the Victoria warehouse, Victoria Wharf, North Dock Basin, Swansea, for a distance of 57 feet, with four floors, and erecting two additional floors on the old building. Mr. A. O. Schenk, M.Inst.C.E., Harbour Offices, Swansea.

Wales.—April 7.—For erection of four houses in Avon Road, near Lower Level station, Blaenavon. Mr. B. J. Francis, architect, Abergavenny.

Wales.—April 12.—For the erection of new station buildings, goods shed, &c., at Gilfach, Glamorganshire. The Great Western Railway Engineer, Newport Station, Newport.

Wales.—April 21.—For new mixed and infants' school (346 places) and cookery kitchen at Builth Wells, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Walney.—For erection of shops and warehouses in Hogue Street, Walney, Barrow-in-Furness, for the Barrow Cooperative Society, Ltd. Mr. E. M. Young, architect, 90 Duke Street, Barrow.

Waltham.—April 5.—For the execution of alterations and repairs at the Waltham Council school, Kent. Mr. C. J. Wanley Croft, correspondent, Bridge, Canterbury.

Wrexham.—April 8.—For carrying out works at the Victoria school conveniences. Borough Engineer's Office, Willow Road.

Wrexham.—April 12.—For erection of a telephone exchange at Wrexham, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

York.—April 4.—For certain alterations and additions to De Grey House, St. Leonards. Mr. F. W. Spurr, city engineer, Guildhall, York.

Yorks.—April 11.—For the following works, for the education committee of the East Riding of Yorkshire, viz.:—(*a*) Erection of a teacher's house, and alterations to school at South Duffield; (*b*) for alterations and additions to the Council school at Pocklington; (*c*) for alterations and additions to the Council school at Withernwick. The Building Surveyor, County Hall, Beverley.

Yorkley.—For erection of a cookery and handicraft centre at Yorkley, near Whitecroft. Deposit 2*l.* 2*s.* Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

## TENDERS.

### ALTHORPE AND KEADBY.

For additions to Althorpe and Keadby Council school, Lincs. Messrs. Scorer & Gamble, architects, Lincoln.

| | | | |
|---|---|---|---|
| Thompson | £1,183 | 0 | 0 |
| Elmes | 1,168 | 10 | 3 |
| Scarborough | 1,144 | 11 | 0 |
| Wright & Son | 1,137 | 0 | 0 |
| Waite | 1,114 | 0 | 10 |
| Hollingsworth Bros. | 1,076 | 10 | 10 |
| Stacey | 1,072 | 10 | 6 |
| Moody Bros. | 1,060 | 16 | 0 |
| Pumfrey | 1,060 | 0 | 0 |
| Teanby, Althorpe, Doncaster (*accepted*) | 1,057 | 10 | 0 |

### BRIGHTON.

For eight double tenement houses, Tillstone Street, for the Borough Council.

| | | | |
|---|---|---|---|
| J. & W. Simmonds | £3,832 | 0 | 0 |
| Cook & Sons | 3,775 | 0 | 0 |
| Hudson & Weeks | 3,730 | 0 | 0 |
| Read | 3,478 | 0 | 0 |
| McMillan, Brighton (*accepted*) | 3,459 | 0 | 0 |

### BROADSTAIRS.

For erection of a new home of rest in Stone Road, Broadstairs, Kent.

| | | | |
|---|---|---|---|
| Holbourn | £1,250 | 0 | 0 |
| Miriams | 1,240 | 0 | 0 |
| Goodburn | 1,200 | 0 | 0 |
| Philpott | 1,197 | 10 | 0 |
| May | 1,182 | 0 | 0 |
| Denne & Son | 1,160 | 0 | 0 |
| Martin | 1,125 | 0 | 0 |
| White, Ramsgate (*accepted*) | 1,028 | 0 | 0 |

### DOVER.

For the erection of a Wesleyan school hall at St. Martin's Hill.

| | | | |
|---|---|---|---|
| Wise | £2,966 | 0 | 0 |
| Parsons | 2,886 | 19 | 6 |
| Wallis & Sons | 2,793 | 0 | 0 |
| Denne & Sons | 2,753 | 0 | 0 |
| Austen & Lewis | 2,613 | 0 | 0 |
| West Bros. | 2,557 | 0 | 0 |
| Lewis & Sons | 2,544 | 0 | 0 |
| Blay | 2,544 | 0 | 0 |
| Hayward & Paramour (*accepted*) | 2,526 | 0 | 0 |

### EALING.

For the erection of new school buildings in connection with Haven Baptist Church, Ealing, W. Messrs. George Ashby Lean & Son, architects and surveyors, 491 Oxford Street, W.

| | Estimate A. | | Estimate B. | Deduction. |
|---|---|---|---|---|
| Myring & Son | £2,450 | 0 | £1,200 | £30 |
| Ansell | 2,340 | 0 | 1,180 | 40 |
| Frost & Co. | 2,167 | 15 | 1,064 | — |
| Bollom | 2,133 | 0 | 1,076 | 29 |
| Thorn | 2,112 | 0 | 1,205 | 75 |
| Dickens (*accepted*)* | *2,070 | 0 | 1,030 | 32 |

### FINCHLEY.

For re-decoration of the Finchley County School, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Education Committee.

| | | | |
|---|---|---|---|
| Ibbetson | £397 | 14 | 6 |
| E. E. & A. Tee | 324 | 10 | 0 |
| Hall & Son | 324 | 0 | 0 |
| Batchelor & Sons (*accepted*) | 298 | 0 | 0 |

## HARTSHILL.

For alterations and additions to the laundry block at the N. S. Infirmary. Messrs. R. Scrivener & Sons, architects, Hanley.

| | | | |
|---|---|---|---|
| Colley & Lindop | £3,850 | 0 | 0 |
| Grant & Sons | 3,725 | 0 | 0 |
| Cornes & Son | 3,575 | 0 | 0 |
| Poole | 3,499 | 0 | 0 |
| Yoxall | 3,445 | 0 | 0 |
| Heath | 3,339 | 0 | 0 |
| Godwin, Hanley (*accepted*) | 3,280 | 0 | 0 |
| Wilton, Junr. | 3,200 | 0 | 0 |
| Meiklejohn & Son | 3,140 | 0 | 0 |

## HOMERTON.

For cleaning, painting, and repairing work at the Eastern Fever Hospital, Homerton Grove, E., for the Metropolitan Asylums Board. Mr. W. T. Hatch, engineer-in-chief.

| | | | |
|---|---|---|---|
| Sage & Co. | £2,140 | 15 | 1 |
| Reason | 1,997 | 0 | 0 |
| Carr | 1,980 | 0 | 0 |
| Johnston | 1,846 | 0 | 0 |
| F. & G. Foster | 1,798 | 0 | 0 |
| Woollaston Bros. | 1,640 | 0 | 0 |
| McCarthy | 1,539 | 0 | 0 |
| Nightingale | 1,526 | 0 | 0 |
| Barrett & Power | 1,487 | 0 | 0 |
| Fenn | 1,469 | 10 | 7 |
| Woollaston & Co. | 1,450 | 0 | 0 |
| Kazak | 1,380 | 0 | 0 |
| Hussey | 1,377 | 0 | 0 |
| Squire | 1,369 | 4 | 1 |
| Vigor & Co. | 1,286 | 0 | 0 |
| Inns | 1,246 | 8 | 10 |
| Oram & Son, Waltham Abbey (*accepted*) | 1,191 | 16 | 9 |

## IRELAND.

For supplying and erecting a skating rink at Bundoran, co. Donegal. Mr. F. G. Townsend, engineer, Ballyshannon, co. Donegal.

Rink, 110 feet by 40 feet.

| | | | |
|---|---|---|---|
| Cooper, Penn & Thorp | £1,125 | 0 | 0 |
| Braby & Co., Ltd. | 780 | 0 | 0 |
| Humphreys, Ltd. | 764 | 0 | 0 |
| Rowell & Co. | 715 | 0 | 0 |
| Woodhouse & Co. | 697 | 12 | 2 |
| McManus | 685 | 0 | 0 |
| Hallwood & Co. | 680 | 0 | 0 |
| Speirs & Co. | 655 | 0 | 0 |
| Main | 627 | 0 | 0 |
| Ginger, Lee & Co. | 624 | 0 | 0 |
| Cross & Cross | 621 | 0 | 0 |
| Wynne | 620 | 0 | 0 |
| Harbrow | 600 | 0 | 0 |
| Smith & Co. | 589 | 10 | 0 |
| Harrison & Co. | 530 | 0 | 0 |
| Hawkins | 520 | 0 | 0 |
| Nichols & Reynolds, Ltd. (concrete and exclusive of floor) | 486 | 0 | 0 |
| Jones | 450 | 0 | 0 |

Rink, 110 feet by 50 feet.

| | | | |
|---|---|---|---|
| Harrison & Co. | 692 | 0 | 0 |
| Jones | 650 | 0 | 0 |
| Hawkins, 28 New Bridge Street, London, E.C. (*accepted*) | 550 | 0 | 0 |

## LONDON.

For the provision of two temporary schools, one at Russell Road for 300 boys, and the other at Frederick Road for 360 girls, for the West Ham Borough Council.

*Frederick Road.*

| | | | |
|---|---|---|---|
| Humphreys | £1,367 | 0 | 0 |
| Harrison & Co. | 1,287 | 0 | 0 |
| Croggon & Co. | 1,250 | 0 | 0 |
| Smith & Co. | 1,210 | 0 | 0 |
| Harbrow | 1,194 | 0 | 0 |
| Banbury, Croydon (*recommended*) | 1,122 | 0 | 0 |

*Russell Road.*

| | | | |
|---|---|---|---|
| Humphreys | 1,197 | 0 | 0 |
| Harrison & Co. | 1,095 | 0 | 0 |
| Smith & Co. | 1,027 | 5 | 0 |
| Harbrow | 1,053 | 0 | 0 |
| Banbury (*recommended*) | 1,012 | 0 | 0 |

## ROWBARTON.

For erecting six houses in Leslie Avenue, for Taunton Co-operative Society, Ltd. Messrs. Sprankling & Price, architects, Taunton.

| | | | |
|---|---|---|---|
| Rendell | £1,770 | 0 | 0 |
| Lowe & Son | 1,620 | 0 | 0 |
| Rabjohns | 1,475 | 0 | 0 |
| Manning & Son | 1,425 | 0 | 0 |
| Smith | 1,419 | 0 | 0 |
| Maddock, Wood Street (*accepted*) | 1,345 | 0 | 0 |

## SOUTHALL.

For re-decoration of the Southall County School, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Education Committee.

| | | | |
|---|---|---|---|
| A. & B. Hanson | £385 | 0 | 0 |
| Platford & Son | 383 | 13 | 0 |
| Jamieson | 375 | 0 | 0 |
| Brown & Son | 349 | 10 | 0 |
| Plaistowe (*accepted*) | 333 | 0 | 0 |

For new elementary school, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Education Committee.

| | | | |
|---|---|---|---|
| Tennant & Co. | £15,722 | 0 | 0 |
| Rice & Son | 13,728 | 0 | 0 |
| Kearley | 13,660 | 0 | 0 |
| Neal | 13,050 | 0 | 0 |
| Bollom | 12,791 | 0 | 0 |
| Lawrence & Son | 12,720 | 0 | 0 |
| Fairhead & Son | 12,537 | 0 | 0 |
| Fassnidge & Son | 12,523 | 0 | 0 |
| Try & Hancock | 12,493 | 0 | 0 |
| Knight & Son | 12,484 | 0 | 0 |
| Lawrance & Son | 12,446 | 0 | 0 |
| Dickens | 12,390 | 0 | 0 |
| A. & B. Hanson | 12,328 | 0 | 0 |
| Lacey | 11,899 | 0 | 0 |
| Mattock Bros. | 11,820 | 0 | 0 |
| Treasure & Son, Ltd. (*recommended*) | 11,475 | 0 | 0 |

## TEDDINGTON.

For re-decoration of the Stanley Road Council School, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Education Committee.

| | | | |
|---|---|---|---|
| Thomas | £464 | 0 | 0 |
| Collinson | 445 | 0 | |
| Harding & Son | 385 | 0 | 0 |
| Rice & Son (*accepted*) | 338 | 0 | 0 |

## TONBRIDGE (KENT).

For the erection of a swimming bath on the Waterfields.

| | | | |
|---|---|---|---|
| Martin & Co. | £804 | 0 | 0 |
| Roots | 792 | 13 | 0 |
| Meades (*accepted*) | 608 | 17 | 3 |

## UXBRIDGE.

For re-decoration of the Uxbridge County School, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Education Committee.

| | | | |
|---|---|---|---|
| Portsmouth | 248 | 10 | 0 |
| Fassnidge & Son | 240 | 0 | 0 |
| Try & Hancock (*accepted*) | 197 | 5 | 0 |

## WALES.

For carrying out the following works, for the Barry Local Education Authority:—(1) Alterations and additions to Holton Road infants' school, Barry; (2) plumbing work in connection with such alterations and additions. Mr. G. A. Birkenhead, architect, 102 St. Mary Street, Cardiff, and St. Nicholas Road, Barry.

*Alterations.*

| | | | |
|---|---|---|---|
| W. H. Evans | £1,875 | 0 | 0 |
| Davies & Sons | 1,750 | 0 | 0 |
| Fisher | 1,584 | 15 | 0 |
| Gibby & Cleak | 1,571 | 15 | 0 |
| Davis & Howell | 1,565 | 0 | 0 |
| Lloyd & Tape | 1,561 | 8 | 5 |
| Vickery Bros. | 1,506 | 7 | 5 |
| E. D. W. Evans | 1,460 | 0 | 0 |
| Price Bros. | 1,437 | 0 | 0 |
| Rendell | 1,381 | 9 | 4 |
| Jones, Barry (*accepted*) | 1,316 | 14 | 6 |

*Plumbing.*

| | | | |
|---|---|---|---|
| Motton, Barry (*accepted*) | 170 | 14 | 2 |

## WALES—*continued.*

For the construction and maintenance of an elliptical skew-arch bridge, 60 feet span, over the river Rhymney at Cardiff, in lieu of the existing masonry bridge, and for the execution of road works. Mr. W. Harpur, M.I.C.E., engineer, Cardiff.

| | | | |
|---|---|---|---|
| Lester | £9,773 | 0 | 0 |
| Williams | 8,802 | 0 | 0 |
| Allan | 8,293 | 4 | 10 |
| Strachan | 8,210 | 0 | 0 |
| Rutter | 7,581 | 4 | 10 |
| Palmer | 7,543 | 0 | 0 |
| Turner & Sons | 7,404 | 15 | 8 |
| Davies | 7,362 | 9 | 4 |
| Wood | 7,342 | 0 | 8 |
| **Barnes, Chaplin & Co.**, Cardiff (*accepted*) | 6,616 | 12 | 2 |

For pulling down and rebuilding the Britannia Inn, at Llanbadoc, near Usk. Messrs. Swalwell & Havard, architects, Newport, Mon.

| | | | |
|---|---|---|---|
| Dean | £1,345 | 0 | 0 |
| Lucas | 1,291 | 10 | 0 |
| Moon | 1,197 | 0 | 0 |
| Ley & Sons | 1,170 | 0 | 0 |
| Bowen | 1,153 | 10 | 0 |
| Kirby | 1,124 | 0 | 0 |
| H. Leadbeter | 1,095 | 0 | 0 |
| Jenkins | 1,089 | 0 | 0 |
| Powles | 1,077 | 0 | 0 |
| Charles | 1,045 | 0 | 0 |
| Prosser | 998 | 10 | 0 |
| King & Co. | 988 | 0 | 0 |
| G. F. Leadbeter | 945 | 0 | 0 |
| Reed, Newport (*accepted*) | 944 | 0 | 0 |

## WELLINGTON.

For erection of public baths, for the Wellington Urban District Council, Salop. Revised tenders. Contract No. 1.

| | | | |
|---|---|---|---|
| Barnsley | £2,846 | 7 | 6 |
| Woodcock & Riley | 2,442 | 14 | 0 |
| Dallow & Co. | 2,345 | 0 | 0 |
| R. & J. Millington | 2,320 | 0 | 0 |
| Bright | 2,219 | 8 | 11 |
| Hovsep | 2,182 | 16 | 2 |
| Hopkins | 2,170 | 0 | 0 |
| Pearce | 2,117 | 10 | 0 |
| J. & T. France | 2,060 | 8 | 3 |
| Holmes, Birmingham (*accepted*) | 2,021 | 16 | 4 |

## RHYL PIER.

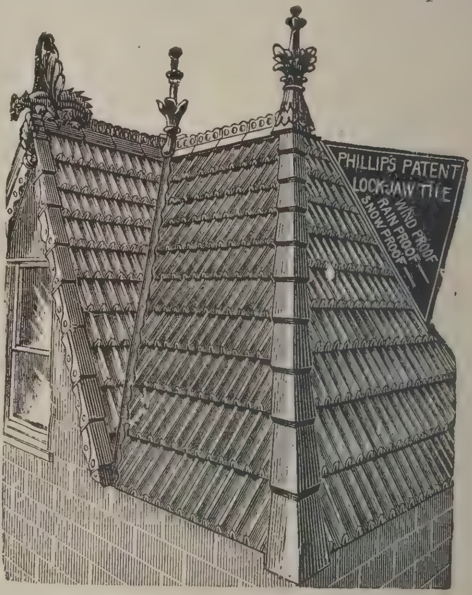
The difficulties connected with the application for a new Provisional Order to enable Rhyl Pier to be extended to deep water, so that steamers can call at all tides, have been overcome, as the Order is expected to be issued within two or three weeks. The promoters have instructed Messrs. Maxwell & Tuke, architects and engineers, 25 Brazennose Street, Manchester, to obtain estimates for the whole of the works. The contracts will be let immediately upon the receipt of the Provisional Order, so that work may proceed early in the spring. The scheme is a large one involving a capital of some 65,000*l.*, and includes encasing the present iron pier in ferro-concrete, widening it and extending it some 600 yards seawards by means of a ferro-concrete jetty. The landing place at the head of the jetty will be constructed in Tasmanian blue gum, and will have a depth of water at low spring tides of 12 feet. The present pier-head is to be considerably enlarged, and on it an open-air enclosure with bank kiosk will be erected capable of seating 1,000 people. Along the five embayments of the pier there will be ornamental kiosks and shelters, each 45 feet long and 12 feet wide, whilst nearer the land end will be erected a large and handsome dining-room to accommodate 400 persons at separate tables.

Between the pier proper and the promenade, on an area of some 6,800 yards, it is intended to erect an amphitheatre with gallery, capable of accommodating 1,400 persons, to be used for variety and minstrel entertainments, together with an assembly room or theatre (accommodating 2,500 persons), with full theatrical stage and galleries. There will also be a visitors' club, with reading, billiard and smoke rooms, twenty-four shops, and two tea-rooms. All these buildings will be erected on terra firma, and are designed with Old English Cheshire framing, and form a most picturesque group.

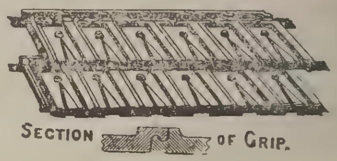
Mr. William Cowie, architect, Ayr, has been instructed to prepare plans for a Board School to be erected in Green Lane, Ayr, for 700 scholars.

## PHILLIPS'S PATENT LOCK-JAW ROOFING TILES.

A tile that was highly spoken of some twenty-five years ago and which has ever since enjoyed a wide popularity must obviously possess considerable merit. It must be about a quarter of a century since the lock-jaw tiles were first put on the market. In the interval there has been a succession of patent tiles of different materials, different shapes, and different sizes which have each enjoyed a short or a comparatively long life and then, in many cases, dropped into obscurity. But the lock-jaw still remains in architects' specifications, and will doubtless continue to do so for many years to come. The tile is of clay subjected to a very great pressure, which renders it non-porous and strong, besides giving it a smooth surface. But the distinguishing feature of the patent is the inter-locking arrangement. Each of the four sides of the tile is moulded with a system of grooves and corresponding tenons, so that every tile locks into others on each side, top and bottom, the lower end of the top tile butting against or locking into the corresponding one underneath. Two patterns—the single grip and the double grip—are made; the former weigh only 35 cwt. per 1,000, and 150 go to the square, which works out at 600 lbs. per square; the latter weigh 40 cwt. per 1,000, and 170 go to the square. They are also made in two colours, red and dun. Half tiles of both patterns are made for every alternate course. The tiles have proved themselves particularly serviceable for use in exposed positions, as they lock so well together that they can defy the heaviest rain and snow, especially if the additional precaution of nailing is taken. Their broken surfaces are also of value as introducing a certain amount of architectural effect to a part that is rather neglected in most designs. Mr. Charles D. Phillips, the maker, has his works at Bridgwater and his head office in Newport, Mon.



SINGLE GRIP.



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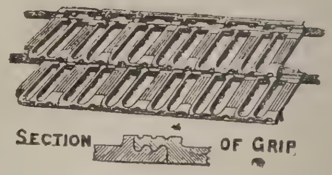

A company is being formed for the erection of a large public hall in Dawlish at an estimated cost of 1,500*l.*

The plans committee of Aberdeen Town Council have passed the plans of a new Roman Catholic church to be built in the Torry district of the city. The estimated cost is 4,000*l.*, and the architect is Mr. Charles G. Menart, Glasgow.

It has been decided to proceed immediately with the enlargement of the Balby church, at a cost of fully 2,000*l.* The project includes the erection of a new east end, and the present seating accommodation will be doubled.

## MURAL PAINTING.*

MURAL painting is one of the oldest forms of expression, and has had a very chequered career. We need not go very far back (or we can go right back to very early times) to find the great use it has always been put to in recording the history of nations—history that perhaps without this mode of expression we should be in ignorance of. Take, for instance, the large egg tempera paintings in the tombs of Egypt, though perhaps the sculptors would claim these incised works as their own. How much more difficult it would be for us to-day to decipher without their aid the life of this great nation, their costume and the minute details of all their crafts, their woodwork, metal work, and ship-building. These paintings were transcripts from nature, glorified a little perhaps by the desire of the chief mourner to have the life of the dear departed handed down in as good a manner as possible; but that was only artistic licence. With this peg to hang their artistic abilities upon the Egyptians teach us colour and design. The colour was used in a crude and conventional manner perhaps, but it has so strangely influenced everything since down to the very wall-papers we are accustomed to. And so we have it from Egypt, Assyria, Persia and the Far East, gradually coming westward, passing through a certain Byzantine decoration, and so on to Italy. Italy contains everything that we know of interest in mural work: these ordinary workmen unconsciously laid down a foundation of decorative design which has had an enormous amount of influence on subsequent work. It was done by men with no R.A. school education, no Prix de Rome Concours as a hall-mark of their ability. At the same time we must remember that every stroke these men did was not only paint, but literature, because it tells us the story of their time far more beautifully than mere prose.

Far away from the seat of the laying down of this great tradition of coloured historical descriptions, and many centuries after, came Giotto and the other great Italian decorators, who though continuing the tradition of being in a sense historians, were rather more imitative artists. This was inevitable. The culture of the masses demanded something more, and they had learnt to see stereoscopically, that is to say they had learnt to see a thing more in the round than people like the Egyptians and the Byzantines. The figure instead of retaining that flat simplicity became more rounded; and the art of seeing cast shadow—which in reality meant the commencement of the realisation of tone—crept in. This was the awakening of a new era; and, as all revolutions, swept away much that was to be regretted; but still it was an advancement. These men were painting their time, using the people around them as their models, mixing them up with characters out of religion and allegory so that the lessons they were teaching would be more comprehensible to the people. All these men, Giotto, Botticelli, and so on, maintained the tradition of decorative mural work.

But something else came from the East, and this time it was a man who brought for sale sweet gums, incense and myrrh. He found, let us suppose, some struggling painter who had not done so well as his neighbour in the matter of altar-pieces, and this Hebrew dealer came to him and said:—"Thy work is not so brilliant as thy brother's; buy a small piece of this gum, take it and dissolve it in some oil, when dissolved spread it lightly over thy work, and it will make it passing beautiful, and you will sell much of it." The artist did this. What was the result? It was to revolutionise and perhaps ruin that great tradition of decorative art; it was the commencement of cabinet pictures. The larger and broader sense of wall decoration was almost obliterated, and was ultimately killed. It created a type of work which in mediæval times showed itself in things like the illuminated missals. But we to-day are trying hard to bring back some of the great work and big tradition of that past.

It is important to know the reason why such work was done, the difficulties which beset these men, and how they overcame them. As to-day, so then, the man who pays the piper chooses the tune. Take, for instance, Giotto, who was employed by the Franciscans. When one comes to think of his education in art, reared as he was in the prevailing type of Byzantine convention; when one realises that he had to deal with a subject like the life of that great patron saint of theirs, and Giotto lived hardly a century after St. Francis, and time went slower then than it does to-day, one marvels more at the work of Giotto in the church at Assisi the more one thinks of it. The Franciscans who demanded such works as the Assisi frescoes were teaching a love of their patron saint concurrently with the love of Christ. They had brought the Bible so much to the understanding of the people, so humanised the gospels that it was quite possible for Giotto to treat the subject with the people to be seen every day around him. Other painters manifest the same desire to recreate the past in the costumes of the present both for religious and secular paintings.

A more modern wall picture which bears a relation to our own day similar to the relation of Giotto's work to the time of St. Francis is in the House of Lords. It is by Daniel Maclise and shows the meeting of Wellington and Blucher. Though it may possess a lot of faults, a lot of things we would rather it had not, still it is an attempt by the artist to render a subject that appealed to him, and that he knew something about; and although we rather laugh at it and jeer at its Early Victorian characteristics, we cannot help admiring it. Lord Leighton's work at South Kensington is of a very different type, and although it would be unseemly to say anything against a man who did as much as Lord Leighton did for decorators, yet one cannot help thinking that in a very short time it will come to be regarded as much a piece of late Victorian work as Maclise's fresco is of early Victorian. The frescoes of Puvis de Chavannes in the Sorbonne possess characteristics which will always remain sound and keep them from getting out of date. This artist was one of the greatest of modern times because he brought back all the tradition of the Italians and placed it on a footing, and carried it out in a technical way that could be understood by all. Professor Moira then came to work by contemporary artists, dwelling at particular length on the frescoes at the Old Bailey. In the mural decorations that he and Sir William B. Richmond carried out at the Central Criminal Court they did everything they could, in conjunction with the late Mr. W. E. Mountford, the architect, to secure a perfectly dry and therefore more or less permanent wall whereon to place their work. This was arranged in the following manner:—First came the outer wall of stone and brick, then an air space, then a wall of one brick thick tied here and there, the inside of these walls receiving a coat of paint, then came another air space, and then another wall of reinforced stick and rag which is French plaster cast with layers of canvas and battens of wood, with a thin structure of woven steel galvanised embedded at the back. This last wall was slightly more forward at the top than at the bottom in order to prevent a certain amount of dust settlement. This was painted at the back. Sir W. Richmond then had a thin coat of marble dust and lime spread over the surface, on which he painted in situ in tempera. Professor Moira said that he himself painted on canvas very open, on which was laid a thin coat of marble chips and white lead, doing most of the more laborious work for the lunettes in the studio, and all the finishing in situ. These canvases were fixed to the walls, which were prepared with two or three coats of white lead with very thick white lead and strong varnish, thus embedding the canvas in two layers of thick paint, and in this way entirely shutting it off from any access to the outer air. Professor Moira painted in oil paint with a medium of hard white wax dissolved in turps.

Sir William Richmond prepared his wall with two coats of slaked lime and marble dust, one thick and the other thin. He tried three surfaces—one rough, the next less rough, and the third quite smooth; the latter proved by far the better method for the ground. When the two coats were nearly dry a thin layer of lime was painted over the whole surface then rubbed down; great care must be taken that the brush is a new one, for if it has been used for white lead great trouble will result. The design was then drawn in charcoal, corrected, and then redrawn in raw sienna and white.

Professor Moira dwelt in conclusion on a point which he had brought out in the course of his lecture, viz., the advisability of dealing with contemporary men and manners in wall painting. A precedent was established by the Early Italian masters, and it has been intermittently continued ever since. When one comes to look at the work of our time, one feels that the work of Brangwyn is going to live. For instance, in designing the decorative frieze for the office of the Grand Trunk Railway in Cockspur Street, there is a certain depth of allegory mixed up with contemporary life. A man represented in modern costume need not look ridiculous.

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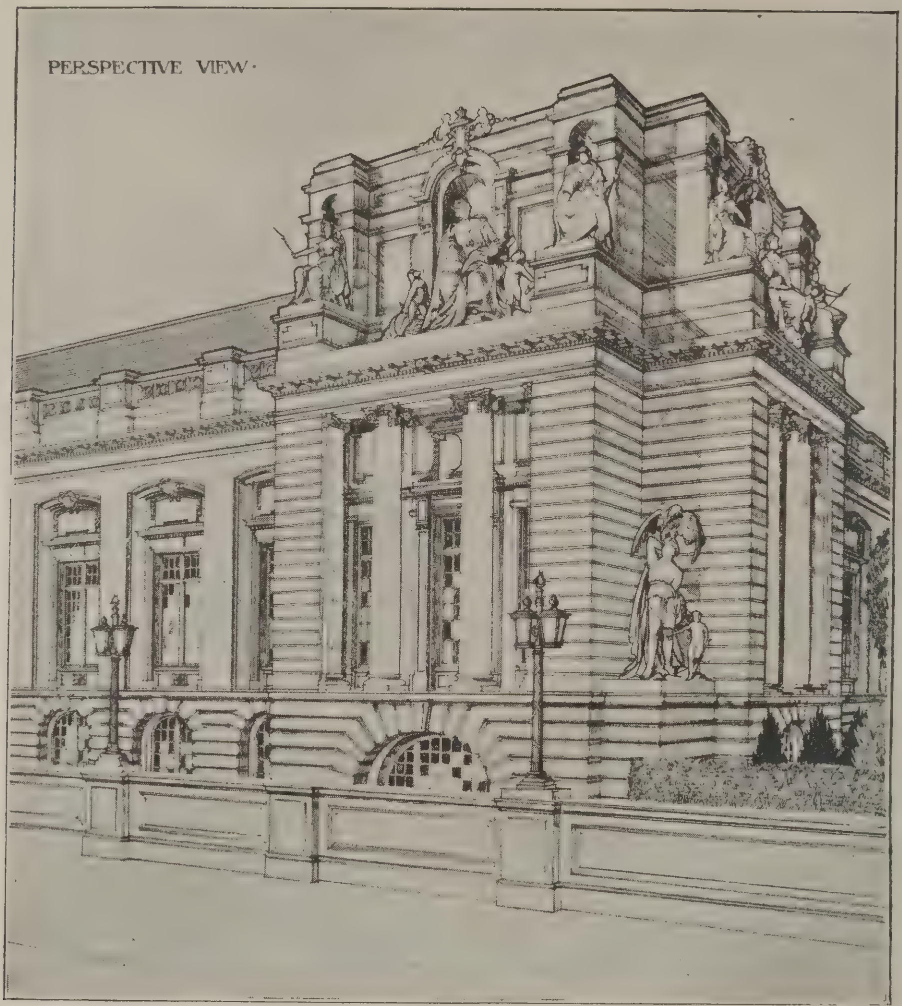
* Abstract of a lecture at Carpenters' Hall on March 16 by Professor G. E. Moira.



SECOND PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By Mr. T. L. Vesper.

## CORRESPONDENCE.

### An Open Letter to Sir Aston Webb, C.B., R.A., F.S.A.

Sir,—Surely the experience you have recently gone through in assessing the designs for the Welsh National Museum must have had a saddening effect, the work thereon by competitors representing an appalling waste of architectural skill, a waste only inadequately represented by thousands of pounds in value, and years—not less than one hundred !—in time.

You, sir, have now an opportunity to stop this ruinous waste, and are to be congratulated in that you can inaugurate a new era in competitions and thus go down to all time as a pioneer. The two competitions (Scottish and Irish) in which you are appointed assessor give you this unique opportunity.

May I venture to suggest to you that small sketch plans of each floor—and plans alone—are necessary for an experienced man, such as you, to form an initial opinion upon? The plan being the vital part of any architectural scheme, the design may safely be left for after consideration when the competitor was in the short leet and paid his "out-of-pocket" expenses.—I am, &c.,

L.

### Treatment of Chimneys.

Sir,—I have always thought that a plain house, if on good lines, can always be redeemed from the commonplace by well-designed and plotted chimneys, and that three essentials are necessary to every good house:—(1) A good front doorway, (2) a good hall and stair, and (3) good chimney treatment. One can hardly get too much of a good thing, but these three points go a long way towards that good thing. Pardon me for saying that poor chimney treatment mars the country house at Neubabelsberg, illustrated in *The Architect* of March 25, when so much else of it is, to my thinking, very good.—Your obedient servant,

E. Swinfen Harris, F.R.I.B.A.

March 29, 1910.

## THE FOUNDATIONS OF STAINED-GLASS WORK.*

In dealing briefly with the material aspect of all branches of painting there are three principal factors to be considered: first, the ground on which the painting is to be executed; secondly, the materials used for elaborating the design; and lastly, the means by which these materials are so attached to the ground as to render the work permanent and lasting.

Stained-glass work differs from almost every other method of decorative painting in that the sheets of glass which provide the ground provide at the same time both the broad masses of colour and the outlines of the design, and the function of the paint is limited in consequence to producing the details of the design and stopping out the light in places, instead of producing it entirely, as in the case of canvas or mural painting. It is, in fact, analogous, only the reverse way, to producing a picture by tinting a photograph or etching. The success of the work depends therefore to a large extent on the choice and quality of the glass to be painted. In the work of the seventeenth and eighteenth centuries the elementary fact that stained glass is painting by means of glass rather than on glass was lost sight of, a colourless and featureless glass being employed merely as a ground on which to produce pictures in coloured enamels.

In discussing our glass two things have to be considered—its function as a ground and its function as a material. Each of these functions for its adequate discharge requires the glass to possess certain distinct properties, which are at first sight antagonistic. As a ground on which to paint the glass must have all the qualities of good glass, and more particularly be highly resistant to atmospheric action, because it will have to be exposed to the atmosphere for centuries under extremely trying conditions. Or, rather, it has to be of such a quality that the action of the weather enhances the beauty of the glass rather than destroys it. Glass should acquire beauty and dignity with age, and not

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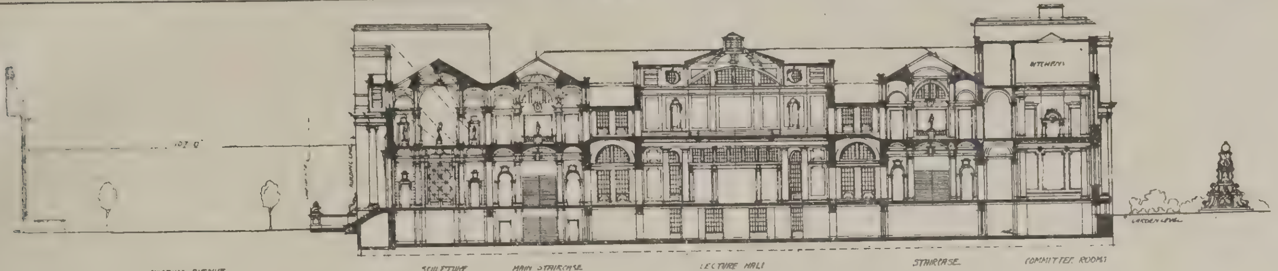
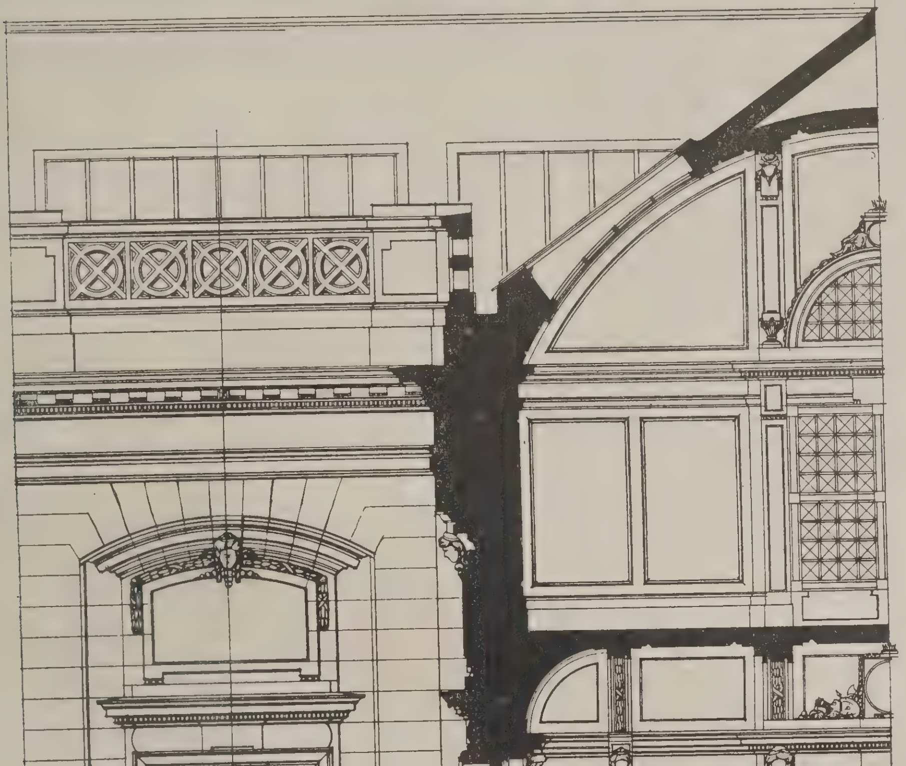
* Abstract of a paper read by Mr. Noel Heaton, B.Sc., before the Society of Arts on March 16.



CROSS SECTION·



HALF INCH DETAIL SHEWING TYPICAL SECTION·

SECOND PREMIATED DESIGN FOR THE NATIONAL MUSEUM OF WALES.—By Mr. T. L. Vesper.

by rotting away necessitate the attentions of the inevitable restorer and their uncertain result.

The attainment of this quality depends largely on the composition of the glass, although local conditions have a certain influence. The Romans, who introduced the making of window glass, knew how to make glass, and their traditions were handed down to later times; but as time went on, from one cause or another, these traditions were lost. By all means honour the mediæval craftsmen and their work, but let us look facts in the face and admit that their knowledge of glass-making from this point of view was very deficient, and as time went on it got worse and worse until their glass, as regards composition, became about as bad as it could be.

Analysis of Roman window glass shows that it contained properties practically identical with those arrived at by modern scientific investigation as being the best possible composition. There was a great falling off in later mediæval glass. Both alkali and earth became excessive, and in consequence the glass was destroyed in several ways. As a matter of fact, it becomes on exposure quite changed in constitution, so that instead of being firmly combined it is possible to decompose it entirely with acid. It is clear then that however we may wish to follow mediæval tradition in other directions, we should not do so as regards the composition of their glass.

Careful analysis between Roman, mediæval and modern window glass suggests that the sheet glass used at the present day is as to its lasting power about as good as is ever likely to be got. And so long as it continues to be made of this composition the glass of to-day will be merely mellowed, not decayed, in the thirtieth century. There is every probability that it will continue because commercial considerations (which have an immense influence on such matters) are favourable. Instead of, as in so many cases, conflicting with the needs of the artist, economy dictates the same composition as the one arrived at from considerations of durability. Of the three principal materials used in glass-making—namely, sand, lime and soda—the last, which is the element of weakness, is by far the most expensive, so that from motives of economy the glass-maker uses as little as he can without raising the fusion point beyond the limits of his furnace.

The only objection to the modern glass is the fact that in general its solubility for silver is not very great—that is to say, it does not stain very nicely; it is true that it can be stained, of course, but you cannot obtain the rich, deep stain so characteristic of, say, the glass of Peckitt's time. And secondly, if fired at the temperature necessary for the fusion of the enamel, it "metals." Staining power depends on slight differences in the composition of the glass, though not sufficient to have any effect on its stability, and it lies in the power of manufacturers to effect an improvement.

The methods of making glass into sheets may be thus summarised:—(1) Cast or rolled (cathedral, &c.); (2) blown into cylinder (Muff glass); (3) blown and spun (crown glass); (4) blown into mould ("Early English" slabs). With the exception of the last, which is a modern introduction, all of these have been employed from very early times, but the second and third were exclusively used in mediæval times in the production of stained glass.

Whichever of these two methods was employed, however, the resulting sheets were never like window glass of the present day. Owing to the primitive nature of the furnaces and appliances the glass was very imperfect or very perfect, according as you look at it from the purely utilitarian or the æsthetic standpoint. That is to say, it would be absolutely useless for picture frames or such purposes owing to the irregular thickness and the "reaminess" caused by slight variations of composition in different parts of the sheet. But these very defects caused the light passing through it to become irregularly refracted and partially dispersed, and gave Gothic glass its peculiar character.

As time went on, however, and window glass began to come into use for domestic and utilitarian purposes, instead of being practically confined to the production of stained-glass windows, people began to demand glass which, instead of being looked at, should be looked through, and manufacturers set themselves to make it more regular and more transparent until it became the wonderful material it is to-day. This, of course, was perfectly legitimate; however much we admire the mediæval glass, we should none of us care to be without the mechanically perfect window glass of to-day. It is dull, featureless and absolutely uninteresting in itself, but it is most exceedingly useful.

The trouble was, however, that when the manufacture of sheet glass was being brought to this state of perfection there was very little sympathy and understanding between the scientific worker and the art worker, and the manufacturers regarded the old "imperfect" glass as a thing of the past, thinking that because their material was of superior utilitarian value it must be superior from every point of view, even from that of the glass painter, ignorant of the fact that the very qualities which they were painstakingly eliminating from their glass were the source of its beauty. The result was that the poor glass painters of the last century had nothing to use except this improved, featureless glass. Nothing else was made, and the glass-makers could not understand how anyone in their senses could possibly want anything else.

With sheets of featureless glass, with colours hard and crude, because uniform throughout, they tried to produce works of art which had to be looked at, and not regarded as a medium through which to view a landscape. Things at last got so bad in this way that a remedy had to be sought. And at first, of course, the remedy was worse than the disease. The glass-makers tried to produce the effect of the mediæval glass by manipulating their glass mechanically so as to give it an irregular appearance. The result may be judged by the following quotation from an article by James Fowler on "The Composition and Texture of Glass of Different Periods":—"The so-called Gothic revival has induced innumerable attempts to imitate the effects of Gothic glass, giving us . . . for the undulating surface of the old, softly mellowing and dispersing the light, a surface furrowed and ridged in vulgar regularity like that of corduroy cloth; for microscopic striæ and a few bubbles here and there, coarse protruding waves made on purpose, the greatest number of bubbles the glass can be made to hold when stirred with a patent stirrer, or ashes or cinders riddled over the surface to make it rough and unsightly. . . . Such wildness of exaggeration of accidental features . . . can have no interest but as indicative of awakening sensibility to the beauty of the ancient."

But this state of affairs was only the result of ignorance on both sides, and once glass workers and glass painters began to come into contact things began to mend. For the last forty years or more glass painters have had at their disposal glass which enables them successfully to carry out the best traditions of the old craft. This glass at the same time possesses the superior qualities of modern glass as regards composition; it combines, in fact, the artistic possibilities of the old with the scientific precision of the modern. There is, however, the constant tendency for history to repeat itself, and for the glass to lose its artistic qualities by becoming too mechanical and perfect, and the remedy for this is that mutual sympathy and understanding between the two sets of workers. Unless the glass painter keeps in touch with the craftsman and realises what he wants, he is sure to go wrong; the making of glass is a science, or ought to be; its manipulation is an art.

The great danger at the present time, however, seems to be the over-elaboration of variety in colour and texture, the striving by the glassmaker to continually produce new effects to tickle the fancy of the artist. The great fault of the modern stained-glass window is the temptation to lack of simplicity and harmony. In the thirteenth century you rarely find more than five colours of glass used in a window (this was about all the range they were capable of producing), but the effects obtained by balancing these few colours one against the other seem to be some of the most beautiful that the world has ever seen. Some modern windows have scarcely two pieces of glass of the same nature. The result may be extremely pictorial, but it misses some of the finest qualities of stained glass.

As the function of the materials for painting the glass is limited to producing the details of design in monochrome, only a very limited range of colour is necessary, and these colours are not bright and transparent, but opaque and confined practically to brown and black. In general nature the material used is a vitreous enamel—*i.e.* a fusible coloured glass, which can, after the painting is executed, be permanently fixed to and incorporated with the glass by the process of firing. This enamel, although of such a comparatively simple and restricted nature, plays a very important part in the production of a window, converting as it does a mere mosaic of colour into a definite subject design, and it has to fulfil certain stringent conditions which may be summarised thus:—

1. Fusibility.—Property of softening at such a temperature that it can be fused on to glass without destroying the texture of the latter.

2. Durability.—Property of resisting the corrosive influence of the atmosphere indefinitely.

3. Opacity.—Property of producing decided opacity in the finest lines, and of retaining this quality through the firing.

4. Working Qualities.—Capability of working easily in a brush when made into a paint.

5. Colour.—Property of retaining the same tone in all variations of light.

These requirements are met by mixing an intensely coloured pigment with a glass of special composition which is called "flux," and grinding the two together to an impalpable powder which can be employed as a paint. The glass painted in this manner being then raised to a red heat, the flux melts and acts really as a vehicle to bind the pigment on to the glass, in precisely the same manner as the oxidised oil in an oil painting or the carbonate of lime in a fresco holds the particles of pigment. As regards the actual composition of this enamel, the pigments used in its preparation must be such as have a very strong colour, are opaque, and are capable of being raised to a red heat without decomposition and without entering into combination with the flux; this puts out of court practically every pigment except the oxides of the metals, and in practice oxides of iron, copper, cobalt and manganese are almost invariably employed, either singly, mixed together, or combined together. By this last are meant such pigments as contain two or more metallic oxides not merely mixed, but in a state of chemical combination; pigments are obtained in this way having qualities which cannot be produced by mere mixing, and the use of such compounds is of great importance in the production of an enamel for glass painting. This pigment, however, only influences the third and fifth requirements enumerated, and its composition is of minor importance to that of the flux, on which depend the most vital properties of the enamel, the fusibility and durability.

The function of the flux is to bind the pigment on to the glass, and however permanent this latter may be it is not much use unless it stays where it is put, so that in effect the permanency of the painting depends solely and absolutely on the flux. The actual composition of the flux is a compromise between the two conflicting requirements of fusibility and durability; in general one may say that the more fusible it is the less durable it is, and *vice versâ*, so that the practice is to make it as durable as one can consistently with the necessity of making it sufficiently fusible to fire properly. The general aim is to make the flux as near as possible in composition to that of the glass, because the durability of the painting depends not only on the actual resistance of the flux to decomposition, but on the glass and flux acting in harmony as regards expansion and contraction, and so forth. In mediæval work the durability of the colour was in many cases superior to the durability of the glass itself owing to the composition of the flux. In the eighteenth and early nineteenth centuries matters were just the reverse—the glass was better, but the enamel was of such indifferent stability that it perished in a very short time, as will be evident to anyone who has closely examined the many windows of the period. This state of affairs was largely due to the fact that the principles governing the craft were but little understood and the flux was made too fusible. This is always a temptation, because not only is a more fusible colour easier and considerably cheaper, but it is much more facile in working, in addition to firing to a nice gloss more readily. The flux of that period, instead of closely approximating to the glass in composition, was widely divergent.

When once attention was drawn to the disastrous state of affairs it was not long before the matter was thrashed out and more satisfactory enamels introduced. The enamel of to-day approximates to the composition of the glass itself, with the exception that the use of lead is retained in most cases. It may be of interest to give some particulars as to the actual process employed in preparing these enamels. The first operation is the making of the flux; this is performed by mixing the ingredients thoroughly together and heating them to a temperature of about 1,500° C. for several hours until the chemical action is complete, and then pouring the molten mass of glass so formed in a thin stream into cold water; the object of this is to render it brittle and break it up into small fragments so as to facilitate the operation of grinding.

The next part of the process is the incorporation of the pigment with the flux and the grinding of the two together into an impalpable powder. This operation involves prolonged grinding in a powerful mill, as the particles of flux have to be uniformly reduced to an extremely small size in order that the enamel may work smoothly and satisfactorily in the brush. A mill having a considerable deadweight crushing power, such as the flat stone mills of the Potteries, is the most satisfactory for the purpose, and the enamel must be ground in water. After it has been ground in this way the enamel, or "colour" as it is called, must be thoroughly tested. A general test is first made by painting a slip of glass with it and noting its behaviour under the brush and its colour as compared with a standard. This gives an indication as to its working qualities, which is further investigated by determining whether the grinding has been properly performed.

The fusibility of the colour is determined by painting it on a slip of glass side by side with a standard and firing in a furnace under observation until the standard is correctly fired; it may also be determined absolutely by means of a pyrometer. A form of fusion pyrometer such as the Seger cone or thermoscope is most useful, the colour being made up into a similar cone and fired side by side with the standards.

Then there is the most important test of durability. One satisfactory method is to boil a slip of glass painted with the colour and fired in normal hydrochloric acid, and then determine the loss of weight in a given time.

If the colour passes these tests satisfactorily it is then finished off by drying. On drying, however, it sets into more or less hard cakes owing to a slight solvent action of the water, and has to be further treated in order to bring it into a state of impalpable powder so that it can be readily rubbed up into a paint with the palette knife. For this purpose it is re-ground dry, or in some cases it is necessary to grind it wet in a medium such as trichlorethylene, which has no action on it and which is very volatile, so that it can be driven off by gently heating, leaving the colour in a soft powder quite free from lumps. For use, the powder so prepared has to be mixed with a medium in order to hold it to the glass temporarily to preserve it against handling before it is fired. This medium should, however, be used to the smallest possible extent, and should be of such a nature that it is either completely volatile or completely decomposed below a red heat, otherwise it will interfere with the firing.

Lastly there is the matter of firing: the means to be employed for heating the painted glass to such a temperature that the flux in the "colour" or enamel will melt and combine with the glass so as to fix the painting permanently. This is purely a process; no materials are involved; all that has to be done is to heat the work red hot. It is a perfectly mechanical operation, and yet an integral part of the craft because a great deal depends on whether it is properly carried out, and because a good many things can go wrong.

The principal troubles that arise in the process of firing may be summarised thus:—

1. Cracking of the glass, due to (*a*) too rapid heating or cooling; (*b*) use of glass under strain or containing "stones."

2. "Sulphuring," due to the action of reducing gases on the lead in the "colour."

3. "Frying" of the colour, due to (*a*) rapid firing; (*b*) excess of medium; (*c*) "stale colour"; (*d*) defective colour; (*e*) hydration of the glass.

4. Blowing of the glass, due to development of gas from the bedding powder.

5. Uneven and incorrect firing, due to bad design or regulation of the kiln.

In the construction of the apparatus to be employed for conducting the firing the modern artist has a distinct advantage over his predecessors. The kilns of the mediæval glass-painters were of very primitive construction, and their firing was largely a matter of luck. According to the records of Theophilus they had no means of controlling the firing; the glass was heated up in a temporary kiln, allowed to cool, and then examined. "And having withdrawn the glass, try whether you can scrape off the colour with your nail; if you cannot, it is sufficient; but if you can, put the glass into the furnace again." That is to say, that as long as the enamel was sufficiently fired to be "tacked on," as we should call it, they would pass it, although no doubt they were aware that for the enamel to be thoroughly durable it should be properly fused on to the glass and show a surface like varnish.

If the work is half fired so as only to be just stuck to the glass, it will not last, however durable the enamel may be, and the inability of the mediæval craftsmen to control their firing accurately so as to ensure perfect fusion in every case must be obvious to anyone who has carefully examined an old window and noticed how, whilst in general the painting may have remained perfectly sound, here and there are found portions which have completely perished. Of course, matters improved somewhat as time went on, but even down to the seventeenth century the glass kiln remained a very crude and uncertain apparatus.

Coming down to our own time, the kiln of yesterday consisted of a cast-iron muffle heated by a coke fire. The kiln of the present is the gas kiln. This was introduced some forty years ago, and has now practically superseded the close kiln, although there are a few who still remain unconvinced as to its advantages. At first it was far from perfect, and despite its many advantages it gave rise to a great deal of trouble, so that a strong prejudice against it was created in many quarters. The mistrust was largely due to causes that have now been remedied, such as a misunderstanding of the principles of firing. The great thing is to be able to control the heat exactly; if the kiln is too hot, as usually happened at first, the glass finishes off rapidly, however slow it may have been in the initial stages, and instead of remaining at the firing point passes beyond it. This is extremely difficult to ensure in a close kiln, and very easy in a properly designed gas kiln, where the temperature is always under absolute control, though at the same time it is easy to go wrong with a gas kiln if this principle is not appreciated. There are several types of kiln available to-day which are capable of firing the glass uniformly and accurately provided they are used by a man who understands them. However, at the present time, in fact, there is no reason why the painter should shrink from firing his work himself and getting exactly what he wants from it; kilns are available which, whilst capable of turning out a considerable quantity of good work, can be placed in a studio and used with such ease and convenience as to enable the artist to do his own firing if he wishes.

Stained glass, and indeed every artistic craft, is not only an art, but also a science. It is, of course, absolutely essential that the glass-painter whose work is to live after him shall be an artist to the backbone, and the technical matters as discussed above are of but secondary importance. I am not going to suggest even that the glass-painter should also be a scientist, although the great works of the past in this and other branches of decorative art were done by master minds familiar with every detail of the technology of their work. But the artist who works in such crafts should be so far conversant with the principles governing his materials—the foundations of his craft—as to know their possibilities, and more particularly their limitations. Division of labour is essential in such a craft as stained glass; the artist cannot be expected to prepare all his materials, as some would have him do, nor perhaps would he be much better off if he did. Let us frankly realise that whatever may have been the case in the past, such a thing is impossible under modern conditions. There must be two sets of workers, the artists and those who work for them; but these two must work together to the same end if the best results are to be achieved; there must, in fact, be co-operation between science and art. The real function of technical education as far as concerns such crafts is to bring about this understanding, to teach the practical craftsman the fundamental principles on which his work is based, which he only learns by long and painful experience in his studio.

## DRY ROT IN TIMBER.

The attention of the Council of the Royal Institute has been drawn to the issue in October 1909 of a leaflet by the Board of Agriculture and Fisheries referring to the increasing prevalence of the disease known as "dry rot" in timber used in the erection of buildings, and, having taken the matter into consideration, the Council deem it to be in the interest of the public generally to issue some observations thereon.

From the official leaflet the following extracts are taken:—

"Infection with the dry-rot fungus sometimes takes place in the forest when felled timber remains stored there for some time. The first evidence of such infection is indicated by the presence of red stripes in the sawn wood. If such wood is thoroughly seasoned the mycelium present in the red stripes is killed. If the seasoning be neglected or imperfectly done, the mycelium, which possesses the power of remaining in a latent condition for some time, commences active growth when the wood is used in any part of a building where it is exposed to dampness, and this in some cases is unavoidable, as when the ends of joists are built into a wall.

"Under such circumstances dry rot eventually appears.

"On the other hand, the fungus is by no means rare on old beams and boards stored in wood yards, &c., and it is mainly from such sources that spores or portions of the spreading mycelium are introduced into buildings by new wood which has become infected.

"The fruit of the dry-rot fungus presents the appearance of irregularly shaped, flattened, or undulating patches of variable size, adhering by their entire under-surface to the substance on which they are growing. When mature the central portion of the patch is covered with an irregular network formed by slightly raised anastomosing ribs, and is of a rich brown colour due to the enormous quantity of spores which are deposited on surrounding objects under the form of snuff-coloured powder. These spores are diffused by currents of air, or by rats, mice and insects.

"The margin of the fruiting patch is surrounded by a snow-white fringe of mycelium which spreads in every direction over surrounding objects, creeping up walls and passing through crevices, the advancing mycelium being supplied with food and moisture from the parent plant growing on wood.

"This food is conducted through cord-like strands which form behind the thin advancing margin of mycelium.

"Owing to this supply of food from a central source the mycelium can extend over stones and other substances not containing food, and thus spread from the basement to the top of a house. Each time the migrating mycelium comes in contact with wood the latter is attacked and a new centre of food supply is established, from which strands spread in search of other sources of food. The mycelium often forms felt-like sheets of large size that can readily be removed intact. These sheets are white at first, but soon change to a pale grey colour—a character by which dry rot can be readily distinguished from another wood-destroying fungus *Polyporus fomentarius*, even in the absence of fruit, the felted mycelium of the latter remaining permanently white.

"The specific name of *lacrymans*, or 'weeping,' alludes to the power of the fungus to attract moisture from the atmosphere. Under certain conditions moisture is absorbed to such an extent that it hangs in drops, or even drips from the surface of the fungus. This moisture assists very materially in rotting the timber, which afterwards becomes quite dry and friable. Hence the popular name 'dry rot,' which alludes to the last and most frequently observed stage of decay."

The depletion of the more matured forest trees resulting in the importation of immature wood is said to be one of the contributory causes of the spread of the disease.

Spores may exist in the earth arising from the roots of trees or other source.

The rapid completion of a house before the materials of which its carcase is constructed have had time to dry thoroughly conduces to the germination of dry rot.

A warm, damp atmosphere surrounding the wood, such as exists under a floor immediately over the ground and in unventilated cellars, is another condition conducing to the spread of the disease.

Although, as above remarked, immature or imperfectly seasoned timber is said to be a cause of the spread of the disease, yet thoroughly matured and sound timber in a warm, moist atmosphere will readily fall a prey if attacked by the mycelium of dry rot, once a spore has been introduced.

It has been proved that the spores of the disease can be carried from house to house on the clothes or tools of workmen, and that wood can be infected from a spore on a carpenter's saw.

From the foregoing it will be seen that the disease may have been introduced (*a*) in the timber; (*b*) from the adjacent earth; and (*c*) accidentally by the importation of a spore. These are conditions over which architects have obviously no control.

## TRADE NOTES.

Messrs. E. H. Shorland & Brother, warming and ventilating engineers, the inventors and makers of the well-known Manchester stoves, have for family reasons converted their business into a private limited company. This has enabled some of the older employés of the firm to obtain a more direct interest in the business. The name of the firm will not be altered with the exception of the addition of the word limited, and the management will be in the same hands as formerly.

Messrs. Clarke, Chapman & Co., Ltd., have opened an office at 29 Queen Anne's Chambers, Broadway, Westminster, S.W., specially for the sale of their Clarke-Chapman water tube boilers (Woodeson's patent).

It is three years since London had a Laundry Exhibition. This will again be held at the Agricultural Hall, London, opening on Saturday. There will be the most comprehensive display of laundry machinery ever brought together in the United Kingdom, and competitions by laundry proprietors and exhibits of work by London County Council scholars will add to the popular interest in the event.

The committee of the Lochgelly Equitable Co-operative Society have given instructions to an architect to prepare plans for the reconstruction of the premises recently destroyed by fire. It is expected that the new structure will cost from 15,000*l*. to 18,000*l*.

THE

# Architect and Contract Reporter.

FRIDAY, APRIL 8, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No. 4725 Holborn.*

*Branch Offices at 43* OLD QUEEN STREET, *S.W., Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2* P.M. *on Thursdays.*

## COMPETITIONS OPEN.

BIRKENHEAD.—The Guardians invite architects residing within the limits of the Birkenhead Union to submit designs for a Children's Receiving Home. Premiums will be awarded for the three first designs. Mr. J. Carter, clerk, Poor Law Offices, Birkenhead.

IRELAND.—April 23.—The Meath County Council invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Apply to Mr. H. J. Cullen, Meath County Council Offices, Navan.

LIVERPOOL.—The Corporation invite designs from architects practising in Liverpool for a branch library estimated to cost not more than 7,000*l*. Mr. W. E. Willink, F.R.I.B.A., will act as assessor. Apply to Mr. E. R. Pickmere, town clerk, Reference Library, William Brown Street, Liverpool.

LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

WALSALL.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

THE Institute of Metals have decided to initiate what is hoped will be an annual series of May lectures. The first of these will take place in London on Tuesday, May 24, when Professor Gowland, F.R.S., vice-president, will deliver a lecture on "The Art of Working Metals in Japan," which will be illustrated by diagrams and lantern slides. Previous to this lecture there will be a ballot for the election of new members.

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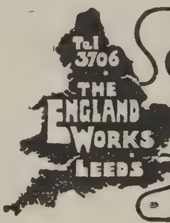

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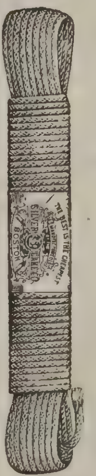

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## CONTRACTS OPEN.

**Ashcott.**—April 11.—For erection of a Council school at Ashcott, near Bridgwater. Messrs. Cottam & Samson, architects, Bridgwater.

**Banbridge.**—April 12.—For the erection of an addition to the technical school. Mr. W. W. Larmor, A.M.Inst.C.E., Banbridge.

**Birmingham.**—April 20.—For the erection of a fire station in Moseley Road, Highgate. Send 2*l.* 2*s.* deposit to the City Treasurer, Council House, Birmingham. Apply by April 8 to Messrs. Mansell & Mansell, 47 Temple Row, Birmingham.

**Bootle (Lancs).**—April 15.—For erection and completion of a public elementary Council school, in the south-east district of Bootle. Deposit 2*l.* 2*s.* Mr. J. Henry Farmer, town clerk, Bootle.

**Chesterfield.**—April 13.—For the construction of a raking floor and other alterations to the Corporation Theatre, Stephenson Memorial Hall. Deposit 1*l.* 1*s.* The Borough Surveyor, Saltergate, Chesterfield.

**Codnor.**—April 11.—For erection of Council school, Codnor, Derbyshire, to accommodate 120 infants. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A, architect to the committee, St. Mary's Gate, Derby.

**Darlington.**—April 16.—For the whole or any portion of the various works required in erection and finishing of a house on the Eryholme Estate, near Darlington. Messrs. Hoskins & Brown, architects, Court Chambers, Darlington.

**Durham.**—April 12.—For new Council schools at Middleton St. George, Hartburn, and Whitton. Mr. W. Rushworth, Shire Hall, Durham. For alterations and improvements at Usworth Colliery, Littletown, and Consett cookery centre. Mr. F. E. Coats, Shire Hall, Durham.

**Earswick.**—April 9.—For erection of a warehouse and workshops at Earswick, near York. Deposit 3*l.* Mr. A. D. Creer, architect, 5 Coney Street, York.

**East Pennard.**—April 11.—For the enlargement of class-room, provision of cloak-room accommodation, &c., at the Council school, for the Somerset County Council. Mr. A. J. Pictor, Bruton.

**Edinburgh.**—April 16.—For a Propagating House at the City Hospital, Comiston Road. Mr. James A. Williamson, A.R.I.B.A., City Chambers, Edinburgh.

**Erith.**—April 18.—For erection of two additional wards and other extensions to the Erith Sanatorium, Little Heath, Belvedere. Deposit 2*l.* 2*s.* Mr. Harold Hind, surveyor, Council Offices, Erith, Kent.

**Exeter.**—For rebuilding Nos. 175 and 176 Sidwell Street, for Mr. J. Hammett. Mr. James Jerman, F.R.I.B.A., architect, 1 Bedford Circus, Exeter.

**Gatley.**—April 14.—For erection of villa in Oakwood Avenue. Mr. W. R. Exley, architect, 2 Burgon Buildings, Fallowfield.

**Gillingham.**—April 14.—For extending the technical institute, Green Street. Deposit 10*s.* 6*d.* Mr. J. L. Redfern, A.R.I.B.A., borough surveyor, Council Offices, Gardiner Street, Gillingham, Kent.

**Halifax.**—April 14.—For the various works required in erection of a pair of semi-detached villas on the Greenroyd estate, Skircoat, Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

**Hazel Grove.**—April 19.—For erection of a public elementary Council school in Chapel Street, Hazel Grove, near Stockport, to accommodate 800 children, with housewifery, laundry, and cookery centres and caretaker's quarters. Deposit 2*l.* 2*s.* Mr. C. T. Adshead, architect, Leinster Chambers, 4 St. Ann's Square, Manchester.

**Heywood.**—April 16.—For erection of an addition to the Heywood Technical School for a picture gallery and museum. Deposit 2*l.* Borough engineer, Mr. J. Ainsworth Settle, A.M.I.C.E., Municipal Buildings, Heywood, Lancs.

**Heywood.**—April 16.—For erection of an extension to the Heywood Technical School for day secondary school and other requirements. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

**Hipperholme.**—For the plumber's and slater's work required in erection and completion of two villas. Mr. Harry Smith, architect and surveyor, Holly Bank, Hipperholme.

**Ilford.**—April 12.—For the erection of an underground convenience in Roden Street. Deposit 2*l.* 2*s.* Mr. H. Shaw, M.I.C.E., surveyor to the Council, Town Hall, Ilford.

**Ireland.**—April 14.—For improvements to St. Mary's Catholic Church, Clonmany, co. Donegal. Mr. J. P. M'Grath, C.E., architect, 6 Castle Street, Londonderry.

**Ireland.**—April 16.—For the erection of a school at Philipstown, King's County. Rev. J. Bergin, P.P., the manager, Philipstown.

**Keighley.**—April 14.—For the several works (except joiner's and painter's) required in the erection of three pairs of semi-detached cottages, at Morton Banks, for the Keighley Industrial Co-operative Society, Ltd. Messrs. John Haggas & Sons, architects, North Street, Keighley.

**Lancaster.**—April 14.—For the erection of a workmen's messroom at the Corporation Gasworks. The Gas Engineer, Lancaster.

**Leytonstone.**—April 29.—For erection of a county high school for 300 girls, to be erected at Forest Road, Leytonstone, Essex. Deposit 5*l.* Send names by April 11. Mr. W. Jacques, A.R.I.B.A., architect, 2 Fen Court, Fenchurch Street, London, E.C.

**Lincoln.**—April 11.—For the construction of a brick and stone tower, 108 feet high to T.W.L., to support a spherical bottomed steel tank, containing over 300,000 gallons of water, and subsidiary works at Westgate, Lincoln, for the Corporation. Deposit 5*l.* 5*s.* with the City Accountant. Mr. Neil McK. Barron, waterworks engineer, Lincoln.

**London.**—May 3.—For erection of a branch library in New Cross Road, S.E., for the Deptford Borough Council, according to drawings and specification prepared by Messrs. Castle & Warren, architects, Talbot House, Arundel Street, W.C. Send 2*l.* 2*s.* deposit by April 9 to Mr. Vivian Orchard, town clerk, Town Hall, New Cross Road, S.E.

**London.**—April 16.—For alterations, &c., at Nos. 61 and 63 Hornsey Rise, N. (Receiving Homes). Deposit 2*l.* Mr. Howard Goodchild, architect, 409 Holloway Road, N.

**Morley.**—April 13.—For the various works required in erection of weaving shed at Valley Mills. Mr. T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, Yorks, and 1 Basinghall Square, Leeds.

**Old Sarum.**—April 13.—For erection of a new isolation hospital at Old Sarum, near Salisbury, Wilts. Send 3*l.* 3*s.* deposit by April 13 to Mr. Francis Hodding, Market House Chambers, Salisbury.

**Prestwich (Manchester).**—April 15.—For the floor and wall tiling, composition flooring, and patent roof glazing required in the erection of new kitchens, stores, and bakery, at the County Lunatic Asylum, Prestwich, Manchester. Mr. Thomas Chadwick, A.R.I.B.A., architect, 16 Princess Street, Manchester.

**Rochdale.**—April 13.—For the construction of an underground accumulator-room and above-ground stores, &c., at the electricity works. Deposit 1*l.* 1*s.* Mr. C. C. Atchison, M.I.E.E., engineer and manager, the Electrical Engineer's Department, Dane Street, Rochdale.

**Rochdale.**—April 20.—For the construction in ferro-concrete of a high-level road and coal store in connection with the gas works. Mr. T. Banbury Ball, the Manager at the Gas Works, Dane Street, Rochdale.

**Royton, near Oldham.**—April 20.—For the work comprised in the provision of shelters and other erections, asphalting of walks, and drainage of site in connection with the park and recreation ground, Radcliffe Street. Mr. Ernest Woodhouse, F.R.I.B.A., architect, 88 Mosley Street, Manchester.

**Seaforth.**—April 25.—For erection of a secondary and technical school in Cambridge Road, Seaforth, Liverpool. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

**Somerset.**—April 12.—For taking down and rebuilding retaining walls and general repairs at the following bridges, for the Somerset County Council:—(*a*) Nettle Bridge, at Oakhill, on the main road from Shepton Mallet to Bath; (*b*) East Chelwood bridge and West Chelwood bridge, on the main road from Bath to Weston-super-Mare, near Pensford, Bristol. Mr. H. T. Chapman, county surveyor, Bath.

**Southowram.**—April 13.—For the various trades required in erection of eleven houses at Bank Top, Southowram, near Halifax. Mr. Lister Coates, A.R.I.B.A., architect, 10 Central Street, Halifax, Yorks.

**Southsea.**—April 9.—For alterations to Messrs. Timothy White Company's premises, 34 and 36 Palmerston Road. Messrs. Rake & Cogswell, architects, Prudential Buildings, Portsmouth.

**Spitalgate (Lincs.).**—April 12.—For pulling down and rebuilding cells with court-room at Spitalgate Police Station, Lincs. Deposit 2*l.* 2*s.* Mr. Jesse Clare, county architect, Sleaford.

**Stretford.**—April 18.—For the erection of a public elementary school at Gorse Hill, Stretford. Deposit 2*l.* 2*s.* Mr. Frank W. Mee, F.R.I.B.A., architect, 32 Victoria Street, Manchester.

The Lizard (Cornwall).—April 11.—For erection of a residence, for Commander Coad, R.N.R. Mr. Edwin Turner, architect, Llandudno, North Wales.

Wales.—April 9.—For alterations to the Corn Exchange, Newport (Mon.). Deposit 2*l.* 2*s.* Mr. H. J. Griggs, A.R.I.B.A., architect, Metropolitan Bank Chambers, Newport, Mon.

Wales.—April 11.—For the erection of a police station at Sketty, Glamorgan. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—April 11.—For erection of two semi-detached villas at Cwmaman, Aberdare. Mr. J. Llewellin Smith, M.S.A., architect, Aberdare.

Wales.—April 12.—For the erection of new station buildings, goods shed, &c., at Gilfach, Glamorganshire. The Great Western Railway Engineer, Newport Station, Newport.

Wales.—April 18.—For the following works, for the Glamorgan County Council, viz. :—(1) New girls' department of the Council school at Bedlinog; (2) new infants' department of the Council school at Taibach, Port Talbot; (3) new higher elementary school at Caerphilly; (4) additions to the Brynnau Council school, near Llanharan; (5) cookery-room at the Council school at Dinas Powis; (6) new latrines at the Council school at Hengoed. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—April 19.—For erection of a Congregational chapel at Cwmgorse. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

Wales.—April 21.—For new mixed and infants' school (346 places) and cookery kitchen at Builth Wells, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Wales.—April 22.—For erection of a public abattoir, stabling, and other works at Pontypool. Deposit 2*l.* 2*s.* Mr. D. J. Lougher, architect and surveyor, Bank Chambers, Pontypool.

Walney.—For erection of shops and warehouses in Hogue Street, Walney, Barrow-in-Furness, for the Barrow Co-operative Society, Ltd. Mr. E. M. Young, architect, 90 Duke Street, Barrow.

Wantage.—April 9.—Tenders in one sum are invited for erection of a school, for the National School Managers. Send names to Rev. W. S. Riddelsdell, Shereborne, Wantage.

Waterswallows.—For erection of farm buildings, &c., at Waterswallows, near Buxton. Mr. C. Flint, architect, Buxton.

Weymouth.—April 14.—For erection of an elementary school for 270 boys at Weymouth. Send names by April 14 to Mr. G. P. Symes, clerk, 9 and 10 East Street, Weymouth.

Whitchurch.—April 11.—For work at the Isolation Hospital and caretaker's cottage at Larksborough, Whitchurch, Hants. Mr. J. S. Knight, assistant superintendent, 6 Station Road, Whitchurch, Hants.

Wrexham.—April 12.—For erection of a telephone exchange at Wrexham, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

Yorks.—April 11.—For the following works, for the education committee of the East Riding of Yorkshire, viz. :—(*a*) Erection of a teacher's house, and alterations to school at South Duffield; (*b*) for alterations and additions to the Council school at Pocklington; (*c*) for alterations and additions to the Council school at Withernwick. The Building Surveyor, County Hall, Beverley.

## TENDERS.

### FAREHAM.

For the erection of a block at the Isolation Hospital. Mr. Wilberforce Cobbett, architect, Fareham, Hants.

| | | | |
|---|---|---|---|
| Wakeham & Sons | £769 | 0 | 0 |
| Willcox | 745 | 0 | 0 |
| Tribbeck | 735 | 0 | 0 |
| Plumber | 720 | 0 | 0 |
| Sprigings | 699 | 0 | 0 |
| Wilkins & Son | 694 | 0 | 0 |
| Buckett | 690 | 0 | 0 |
| Jenkins & Sons | 687 | 0 | 0 |
| Mussellwhite & Sapp | 675 | 15 | 0 |
| Draper | 675 | 0 | 0 |
| Newbury | 670 | 0 | 0 |
| Tanner | 670 | 0 | 0 |
| Croad, Gosport (*accepted*) | 667 | 0 | 0 |

### HALSTED (ESSEX).

For erection of new buildings in connection with the Greenwood Certified Industrial School for Girls.

| | | | |
|---|---|---|---|
| Ward | £1,607 | 0 | 0 |
| French | 1,552 | 0 | 0 |
| Beaumont | 1,513 | 0 | 0 |
| Dobson | 1,494 | 0 | 0 |
| Deaves | 1,493 | 10 | 0 |
| Sudbury | 1,455 | 10 | 0 |
| Clarke | 1,429 | 0 | 0 |
| Sharpe | 1,429 | 0 | 0 |
| Farr | 1,410 | 0 | 0 |
| Pudney & Son, Colne Engaine (*accepted*) | 1,387 | 0 | 0 |

### HARRINGTON.

For laying out cemetery ground, erecting a boundary wall, chapel, and curator's house, at High Harrington, Cumberland. Mr. C. W. Eaglesfield, architect and surveyor, Workington.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Ferguson & Sons, Harrington, builder and joiner | £1,494 | 6 | 11 |
| Mandle & Co., Maryport, slater | 95 | 10 | 0 |
| Perrin, Workington, plasterer | 56 | 0 | 0 |
| Pape & Co., Workington, plumber | 43 | 0 | 0 |
| Sanderson, Workington, painter and glazier | 40 | 0 | 0 |

### KNARESBOROUGH.

For works required in connection with erection of new offices, for the Urban District Council.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Kitchen & Son, mason | £857 | 8 | 6 |
| Kitchen & Son, joiner | 354 | 8 | 0 |
| Coleman, plasterer | 72 | 2 | 10 |
| Thompson, plumber | 71 | 0 | 0 |
| Shepherd, slater | 52 | 10 | 0 |
| Morley & Son, painter | 14 | 7 | 6 |

### LEWISHAM.

For cleaning, painting, and repairing work at the Park Fever Hospital, Hither Green, for the Metropolitan Asylums Board. Mr. W. T. Hatch, engineer-in-chief.

| | | | |
|---|---|---|---|
| Shorter | £2,453 | 3 | 9 |
| Sage & Co., Ltd. | 2,385 | 15 | 1 |
| Woollaston Bros. | 2,043 | 0 | 0 |
| Hussey | 1,894 | 0 | 0 |
| McCarthy | 1,769 | 0 | 0 |
| Squire | 1,748 | 14 | 6 |
| Inns | 1,728 | 7 | 6 |
| Kazak | 1,689 | 0 | 0 |
| Fenn | 1,652 | 18 | 3 |
| Nightingale | 1,597 | 0 | 0 |
| Vigor & Co., Poplar (*accepted*) | 1,387 | 0 | 0 |

### OKEHAMPTON (DEVON).

For sewerage and sewage disposal works at Okehampton, for the Town Council.

| | | | |
|---|---|---|---|
| T. Shaddock | £7,548 | 0 | 8 |
| Doney | 6,662 | 17 | 0 |
| Vanstone & Sons | 5,543 | 4 | 8 |
| Pike | 5,381 | 13 | 0 |
| J. Shaddock | 5,297 | 5 | 8 |
| Bate & Co. | 5,074 | 7 | 6 |
| Harris | 5,024 | 0 | 0 |
| Bennett | 5,016 | 0 | 0 |
| Budge & Co. | 4,919 | 4 | 9 |
| Shaddock & Co. | 4,788 | 13 | 8 |
| Williams, Farley & Co. | 4,782 | 16 | 6 |
| Tolly & Sons | 4,742 | 16 | 0 |
| Avery | 4,707 | 12 | 10 |
| Ellis & Sons | 4,609 | 7 | 6 |
| Furse & Sons | 4,456 | 6 | 2 |
| Brebner & Co. | 4,555 | 12 | 0 |
| Coles | 4,449 | 3 | 0 |
| Ash & Sons | 4,412 | 14 | 0 |
| Steer & Pearse | 4,385 | 0 | 0 |
| Blatchford & Dawe | 4,290 | 0 | 0 |
| Sleeman | 4,114 | 15 | 0 |
| Barch | 4,047 | 16 | 10 |
| Wickstead & Co., London (*accepted*) | 3,983 | 8 | 2 |

### PLYMOUTH.

For erection of a store at the Victoria Wharves, Cattedown, Plymouth. Mr. W. F. Tollit, architect, Totnes.

| | | | |
|---|---|---|---|
| Coles | £581 | 0 | 0 |
| Pethick Bros. | 544 | 0 | 0 |
| Moore & Sons | 490 | 0 | 0 |
| Tozer & Sons | 429 | 0 | 0 |
| Hoskin, Plymouth (*accepted*) | 372 | 0 | 0 |

## SCOTLAND.

For the works required in erection of hall and houses at Windygates, for the L.O.A. Shepherds. Mr. G. Charles Campbell, architect and surveyor, Methil.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Black & Sons, Edinburgh, mason | £1,246 | 0 | 0 |
| Dewar, Methil, joiner | 800 | 0 | 0 |
| W. & J. Easton, Kirkcaldy, plasterer | 298 | 0 | 0 |
| Nicol, Buckhaven, plumber | 193 | 15 | 3 |
| Wardlaw, Windygates, smith | 135 | 6 | 3 |
| Currie, Kirkcaldy, slater | 126 | 0 | 0 |
| Allan, Markinch, painter | 67 | 11 | 0 |
| Haxton & Co., Kirkcaldy, glazier | 22 | 18 | 2 |

For extension of Ovenstone Hospital, Pittenweem, for St. Andrews district committee, Fife County Council. Mr. Henry, architect, St. Andrews.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Gray & Pringle, Anstruther, plumber | £368 | 8 | 0 |
| Knowles, Anstruther, mason and bricklayer | 305 | 3 | 2 |
| Wheeler & Son, Pittenweem, joiner | 174 | 9 | 6 |
| Williamson, Pittenweem, plasterer and tiler | 124 | 6 | 7 |
| Greig, St. Andrews, slater | 78 | 15 | 4 |
| Briggs & Son, Dundee, asphalte work | 22 | 7 | 1 |

## SLOUGH.

For alterations to shops No. 144 High Street, and converting premises at rear into a cinematograph theatre, for the Theatres Contract and Finance Co., Ltd. Messrs. Moscrop-Young & Glanfield, architects.

*Building contract.*

| | | | |
|---|---|---|---|
| Pitcher & Son | £1,028 | 0 | 0 |
| Street | 981 | 0 | 0 |
| Goddard & Son | 950 | 0 | 0 |
| Bowyer (*recommended*) | 942 | 0 | 0 |
| Deverill | 939 | 10 | 0 |

*Steelwork.*

| | | | |
|---|---|---|---|
| Aston & Sons | 121 | 10 | 0 |
| British Challenge Glazing Co. | 82 | 7 | 0 |
| Rowell & Co. (*recommended*) | 70 | 15 | 0 |

## STON EASTON.

For erection of cottages at Old Down, Ston Easton, near Bath. Mr. W. F. Bird, architect, Midsomer Norton.

*Contract No. 1—Eight houses.*

| | | | |
|---|---|---|---|
| W. & R. C. Hurford | £1,981 | 0 | 0 |
| Williams & Sons | 1,920 | 0 | 0 |
| Harris | 1,903 | 0 | 0 |
| Smith | 1,901 | 0 | 0 |
| Dunthorn | 1,792 | 0 | 0 |
| Stockham | 1,745 | 0 | 0 |
| Pittard & Son | 1,699 | 0 | 0 |
| Flower | 1,475 | 0 | 0 |
| Coles Bros. | 1,464 | 0 | 0 |
| Childs & Townsend | 1,414 | 0 | 0 |
| Bird & Son, Radstock* | 1,352 | 0 | 0 |

*Contract No. 2—Twelve houses.*

| | | | |
|---|---|---|---|
| W. & R. C. Hurford | 2,954 | 0 | 0 |
| Harris | 2,845 | 0 | 0 |
| Williams & Sons | 2,840 | 0 | 0 |
| Smith | 2,804 | 0 | 0 |
| Dunthorn | 2,670 | 0 | 0 |
| Stockham | 2,605 | 0 | 0 |
| Pittard & Son | 2,527 | 0 | 0 |
| Flower | 2,190 | 0 | 0 |
| Coles Bros. | 2,179 | 0 | 0 |
| Childs & Townsend | 2,121 | 0 | 0 |
| Bird & Son, Radstock* | 2,004 | 0 | 0 |

*Contract No. 3—Twenty houses.*

| | | | |
|---|---|---|---|
| W. & R. C. Hurford | 4,912 | 0 | 0 |
| Williams & Sons | 4,750 | 0 | 0 |
| Harris | 4,729 | 0 | 0 |
| Smith | 4,692 | 0 | 0 |
| Dunthorn | 4,426 | 0 | 0 |
| Stockham | 4,320 | 0 | 0 |
| Pittard & Son | 4,125 | 0 | 0 |
| Flower | 3,663 | 0 | 0 |
| Coles Bros. | 3,608 | 0 | 0 |
| Childs & Townsend | 3,535 | 0 | 0 |
| Bird & Son, Radstock* | 3,300 | 0 | 0 |
| Architect's estimate | 3,616 | 0 | 0 |

*Extra for walls and gates for twenty houses.*

| | | | |
|---|---|---|---|
| Bird & Son, Radstock* | 120 | 0 | 0 |
| Architect's estimate | 100 | 0 | 0 |

* Accepted subject to certain revisions.

## WALES.

For erecting a new church, Newbridge, Mon., for the trustees of the Zoar Welsh Congregational Church. Mr. J. W. Aldiss, M.S.A., architect and surveyor, Newbridge, Mon.

| | | | |
|---|---|---|---|
| Howells | £1,775 | 3 | 3 |
| Bloxham | 1,742 | 0 | 0 |
| Williams | 1,654 | 0 | 0 |
| Davies & Sons | 1,650 | 0 | 0 |
| J. T. Jones | 1,575 | 0 | 0 |
| Morgan & Co. | 1,500 | 0 | 0 |
| Price Bros. | 1,498 | 0 | 0 |
| W. Jones | 1,495 | 0 | 0 |
| Leadbeater | 1,486 | 0 | 0 |
| King & Co. | 1,438 | 0 | 0 |
| Reed | 1,395 | 0 | 0 |
| Jenkins & Co. | 1,389 | 0 | 0 |
| Evans | 1,380 | 0 | 0 |
| Morgan | 1,360 | 0 | 0 |
| Gregory Bros. | 1,320 | 0 | 0 |
| A. & J. Richards | 1,272 | 0 | 0 |
| Jones & Jones | 1,177 | 15 | 5 |
| Edwards, Newbridge (*accepted*) | 1,137 | 17 | 0 |

For making up the following streets, viz., Amesbury Road, Amesbury Lane, Blenheim Road, Deri Road, Ilton Road, Kimberley Road, Kimberley Lane North, Kimberley Lane South, Ladysmith Lane, Roath Branch Lane East, Waterloo Road, North Lane, Gwendoline Place, &c., for the Cardiff Corporation. Mr. W. Harpur, M.I.C.E., city engineer.

| | | | |
|---|---|---|---|
| Davies | £9,614 | 15 | 7 |
| Williams | 9,511 | 15 | 7 |
| Osmond Bros. | 9,349 | 9 | 2 |
| Baker & Co. | 8,585 | 5 | 5 |
| Pomeroy & Co., Cardiff (*accepted*) | 7,867 | 0 | 0 |

## WOOTTON BASSETT.

For a covered service tank, &c., Coxstalls, for Cricklade and Wootton Bassett Rural District Council. Mr. F. Redman, engineer, Swindon, Wilts.

| | | | |
|---|---|---|---|
| Davis Bros. & Co. | £859 | 0 | 0 |
| Butler & Co. | 817 | 2 | 0 |
| Whessoe Foundry Co. | 712 | 0 | 0 |
| Newton, Chambers & Co. | 681 | 0 | 8 |
| Flewelling | 678 | 5 | 9 |
| Thompson | 667 | 2 | 6 |
| Piggott & Co. | 661 | 9 | 2 |
| E. C. & J. Keay | 647 | 0 | 0 |
| Phœnix Foundry Co. | 646 | 12 | 2 |
| C. & W. Walker | 640 | 0 | 0 |
| Cleveland Bridge and Engineering Co. | 637 | 0 | 0 |
| Holmes & Co. | 636 | 17 | 6 |
| Piggott & Co. | 620 | 11 | 8 |
| Goddard, Massey & Warner | 601 | 15 | 4 |
| Gibbons Bros. | 576 | 12 | 0 |
| Cockey & Sons, Frome (*accepted*) | 518 | 10 | 0 |
| Westwood & Wrights | 512 | 0 | 0 |

## TRADE NOTES.

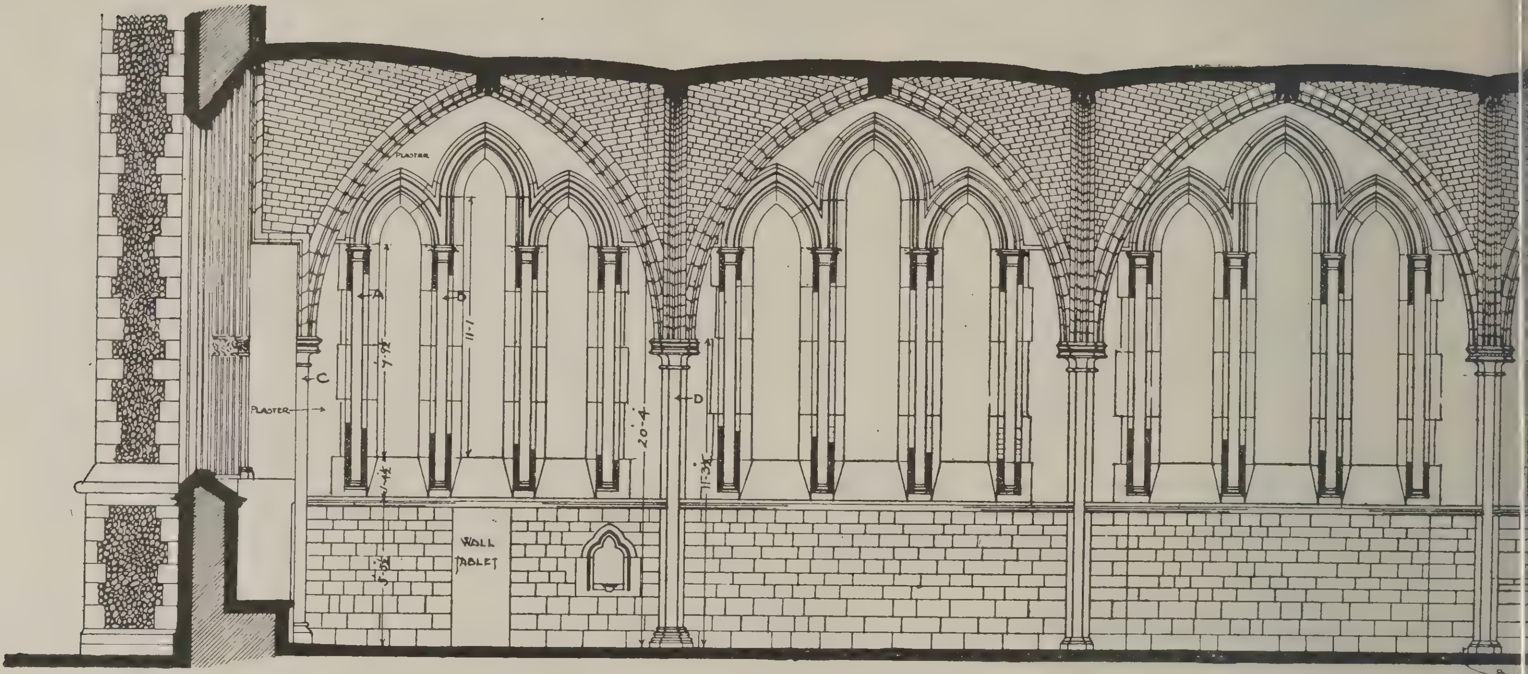
Messrs. Kershaw, Brassington & Co., of Lancaster and Settle, have just completed the ventilation of the new Central Post Office, London.

The contracts for the electric lifts for the South Manchurian Railway, and also for the Shanghai Municipal Council buildings, have been obtained by Messrs. A. W. Penrose & Co., Ltd., of 109 Farringdon Road, E.C., in competition with German and American makers.

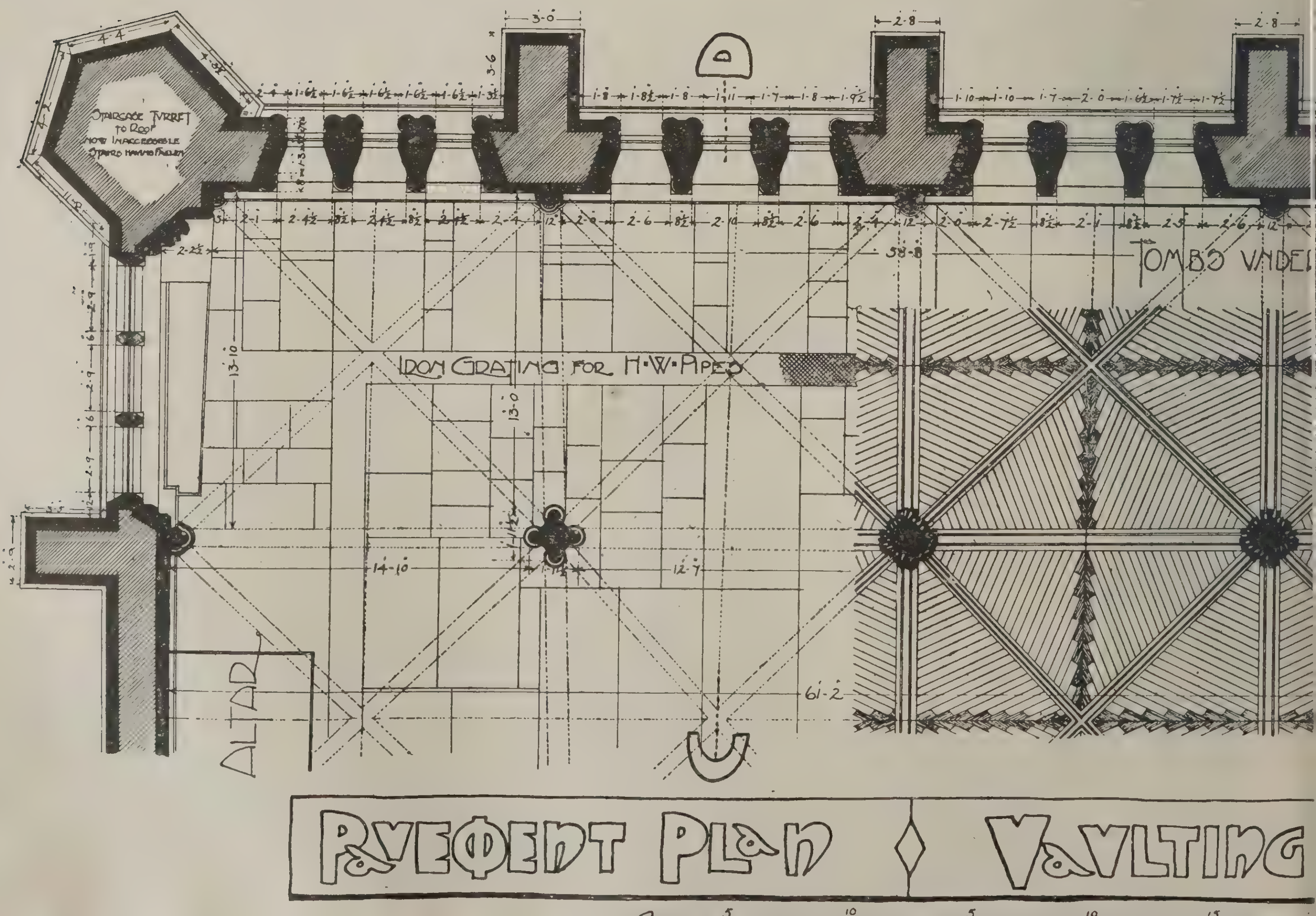
At Dumbarton Dean of Guild Court last week, lining was granted to Messrs. Denny & Co. for the erection of a large machine shop, a small machine shop, and a valve shop. The contract for the extension is in the hands of Sir William Arrol & Co., Glasgow, and the cost will be about 50,000*l*.

The "Boletin Oficial" of the Argentine Republic contains decrees approving the plans and estimate of about 187,000*l*. for the construction of the Central National College of Buenos Aires; and the plans and estimate of about 61,000*l*. for the building of a station at Santa Fe on the Central Northern Railway. The requisite call for tenders is authorised in both cases.

# SOUTHWARK CATHEDRAL ◆ MEASURED



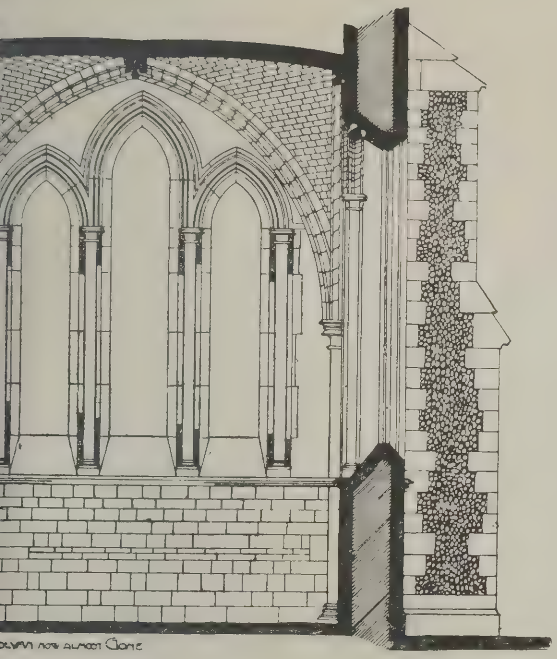
## LONGITUDINAL SECTION LOOKING


STAIRCASE TURRET TO ROOF NOW INACCESSIBLE STAIRS HAVING FALLEN
4-4
4-3½
11-8
2-2½
3-0
3-6
2-8
2-8
58-8
13-10
13-0
14-10
12-7
61-2
IRON GRATING FOR H·W·PIPES
TOMBS UNDER
ALTAR

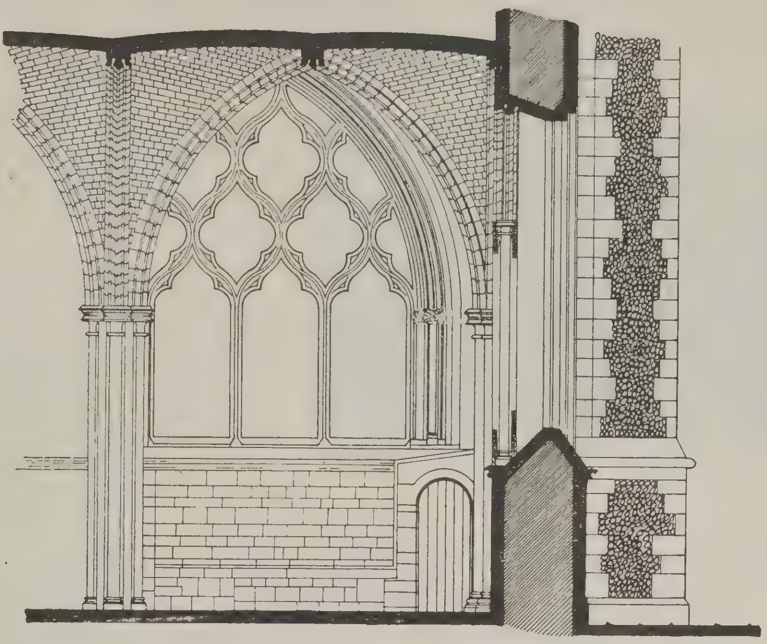
## PAVEMENT PLAN ◆ VAULTING

SCALE 5 10 5 10 15

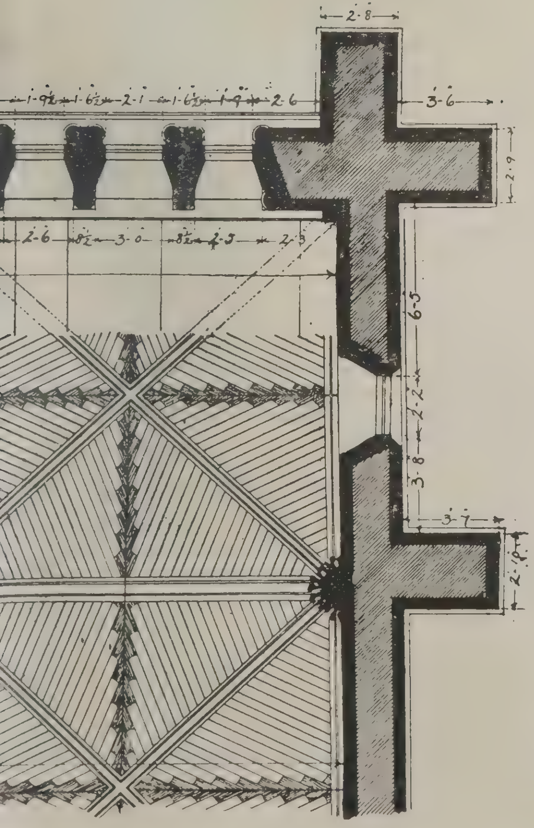
# DRAWING OF THE RETRO-CHOIR



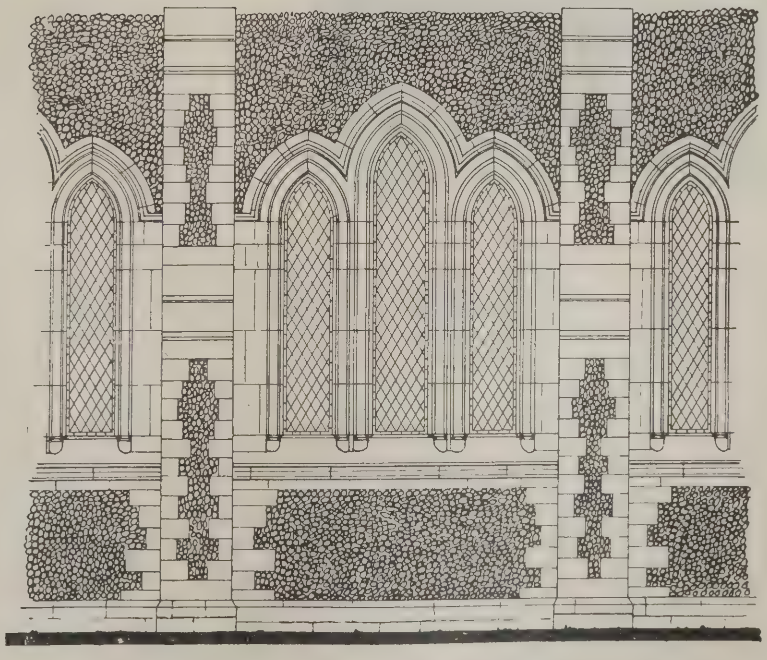
ST



TRANSVERSE SECTION
C·D



PLAN



EXTERNAL EAST ELEVATION

OF FEET

∵ REGINALD PYWELL MENS AND DELT ∵

## WATERPROOF PORTLAND CEMENT.

An important and at the same time highly economical method of making cement and concrete absolutely waterproof is being introduced into this country by the British Ceresit Waterproofing Company, Ltd., of Caxton House, Westminster. This most desirable end is effected by the use of Ceresit, a preparation which originated in Germany, and has been used with great success in that country and in other parts of the Continent, as well as in Egypt, Siam and America.

Ceresit is described as a cream white paste of about the consistency of butter. When added to water in the proportion of one to twelve, it dissolves immediately, turning the water to a milky white fluid. This used, as is ordinary water in the mixing of cement or concrete, makes the latter completely proof against the penetration of moisture or water, even under a pressure as high as 70 lb. per square inch. It is also claimed for it that it is sufficiently elastic to contract and expand under varying extremes of temperature, thus avoiding all likelihood of damage through intense extreme heat or frost. All this is effected without any increase in cost of labour. The water in which the Ceresit is placed mixes just as easily with cement as other water. There is no smell, and the only difference in the colour of the finished cement is that it is a very little lighter than when made in the ordinary way.

BATHS AT LIEGE.

CHATEAU AT STERREBECK.

Among many hundreds of structures in the building of which Ceresit has been used are the Kaiser's Castle at Posen, Germany; the City hospitals, Düsseldorf; several Government dams in Germany, water tower and swimming bath at Brussels, public schools at Vienna, electricity works at Bangkok, Siam; Protestant church at Alexandria, reinforced concrete cistern for the U.S. Government in Florida, and power plant in Chicago. Ceresit is also being used in large quantities by the State Government railways of Germany, France, Russia, and Austria, for tunnels, embankments, reservoirs, locomotive turntable foundations, water tanks, &c. We illustrate two buildings in the construction of which Ceresit has been used with complete success—one a château at Sterrebeck, which is surrounded by water; the other the public baths at Liège.

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The absence of building by-laws in Perthshire is commented upon by Mr. R. M'Nicoll, the sanitary inspector for the county, in his annual report. At present, he says, no power is given to the public health department to interfere with any dwelling house or other premises during construction with a view to proper provision being made for the prevention of dampness, ventilation, testing of drainage, and other details.

## GLASGOW MAIN DRAINAGE.

The new pumping station which has been constructed in connection with the South Side section of the Glasgow Main Drainage Scheme was formally opened on Monday, the 4th inst.

For many reasons great difficulty was experienced in finding a site for Kinning Park Pumping Station with, among other requirements, good substrata. In August 1907 it became clear that the completion of the scheme would be seriously prejudiced unless an immediate start were made with the construction of this station on the site then authorised, its grave drawbacks notwithstanding. The Sewage Committee then approved of the design submitted by the consulting mechanical engineer (Mr. D. Home Morton), the general manager (Mr. Thomas Melvin), and Mr. W. C. Easton, engineer on construction and formerly resident engineer.

Shortly after they instructed Mr. Easton to proceed forthwith with its construction by their main drainage staff, holding him responsible for the construction of the whole station, notwithstanding its obvious difficulties, and the necessary barricade was erected on November 1, 1907. The site was of a cramped nature, being restricted on one side by a five-storey building over 70 feet high, on another by a transformer station delivering power to a large section of the tramways, and on the remaining two sides by streets carrying tramways.

The strata consisted of 19 feet of fine dry sand, followed by 44 feet of fine running silt, underlain at 63 feet from the surface by boulder clay. The level of the incoming sewer necessitated the excavations being carried down to a depth of from 45 to 51½ feet. The area to be excavated was over 100 feet long, varying from 50 to 100 feet in breadth. The troublesome stages were:—

1. Underpinning of the two adjacent buildings to 20 feet from the surface—*i.e.* just into the silt. The streets were also supported by walls, and the area thus enclosed excavated down to the running silt.
2. The forming of a silt-tight curtain extending into the boulder clay, enclosing the area to be excavated in the silt. This was effected by driving close-fitting sheet piling of timbers, 45 feet to 50 feet long, from the top of the silt.
3. The subdividing of the area thus protected into 34 pockets by internal sheet piling driven into the boulder clay.
4. The excavating to and plugging with concrete at 45 to 51½ feet from the surface of the bottom in each of the 34 pockets. This left from 18 to 12 feet of silt under the concrete and above the clay. This last was the critical stage. It occupied six weeks, and was completed on February 3, 1909.
5. The forming of a reinforced concrete raft on the internal piles, cut at the necessary level, over the whole area, followed by the building thereon of the walls—the external walls in concrete specially reinforced—up to the top of the silt.

The remainder of the work was by comparison easy, and the pump-house, roofed at a height of 110 feet from the foundation, was handed over to the consulting mechanical engineer on July 1, 1909. Although Mr. W. C. Easton and the contractors, Messrs. Glenfield & Kennedy, hydraulic engineers, Kilmarnock, had been previously advised by the resident engineer to keep back their work, they responded so promptly to a request to proceed that the station was put into work before the end of March 1910, or within two years and five months from the commencement of operations. The total cost of the station will be about 95,000*l*.

The pumping machinery raises the sewage from the intercepting sewer in St. James Street and delivers it through two rising mains into the main outfall in St. Andrew's Drive. There are three pumping engines, and provision is made to receive a fourth without interrupting the work of the pumps now erected. Two of the pumps are intended to deal with the present wet weather flow of sewage, the third being generally at rest as a standby. With the opening, probably in May, of the pumping station and purification works at Shieldhall the Glasgow Main Drainage Scheme will be completed, whereby the sewage of the city will be diverted from the Clyde into the new sewers and scientifically treated at the three outfall works at Dalmarnock, Dalmuir, or Shieldhall. The cost of the whole undertaking will probably total nearly two and a half millions sterling.

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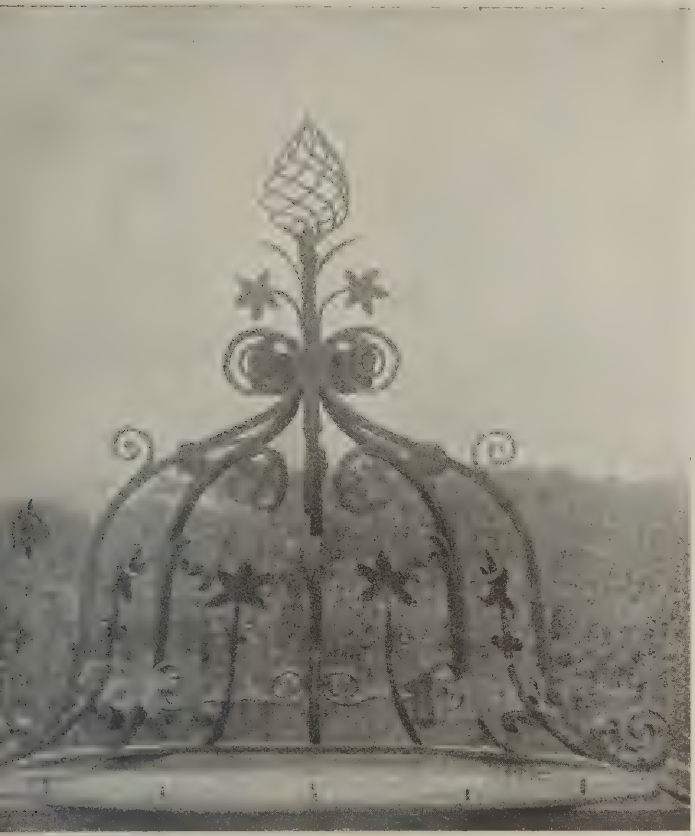
The British Consul at Alexandria reports with reference to a notice relative to the proposed erection of a theatre at Alexandria that the Municipality are prepared to receive tenders up to April 30. The auditorium must be capable of seating from 1,200 to 1,500 people; the cost of construction should be about 61,560*l*.

## WROUGHT-IRON WELL COVER.

This wrought-iron well cover was made without models or drawings by George Male, village blacksmith and farrier at Selsey Bill, Sussex, in his spare time, from rough sketches and suggestions by the owner, Mr. Edward Heron-Allen, of Large Acres, Selsey Bill. The whole weighs one and a half tons. There is also an elaborately wrought flange wheel and spout to the pump, which have not been photographed. The three front bars and intermediates were removed previous to taking the photograph in order to show the outlines better.



WROUGHT-IRON WELL COVER.

## THE CHINESE BUILDING MARKET.

The United States Chargé d'Affaires at Peking has furnished to his Government the following information concerning the letting of contracts and the supplying of materials to contractors for the Chinese Government, which, he says, applies fully to building construction in North China and, in great degree, throughout the Chinese Empire:—

The Chinese Government have no rules, printed or otherwise, for letting contracts, or for buying materials. The man on the spot with the lowest price and quickest delivery gets the work. Ninety per cent. of all the building done in China is done by Chinese contractors. When foreign material is specified, such as heating plants, plumbing, electric light plants, light fixtures, constructional steel, &c., tenders for these materials, either delivered on the ground or put in place, are invited from the many foreign firms in Tientsin or Shanghai. These firms hold agencies for the materials required, and all arrangements are made with them. Neither the foreign engineer nor the native contractor deals directly with the home houses, as it saves much trouble to deal with large houses well established in China. The prices of the latter include freights, duties, &c., and, where necessary, quotations are given including landing the goods where wanted and putting them in position.

Unless connections are made with a well-established firm, or a permanent agency for a special line of goods created, there is little chance of introducing foreign building material into China. As the large firms have their own expert engineers, a contractor can get fair prices quoted for everything at short notice. These firms make it their business to be closely in touch with all proposed work, both Government and private. The terms of payment usually offered by the Government are one-third on arrival of shipping documents, one-third on delivery, and one-third on acceptance. These Government terms were varied considerably during the last year, however; in order to help the foreign firms, as money was tight and exchange bad, the Government paid on several occasions one-half on signature of contract and one-half on completion of work.

## EXTENSION OF PUMP ROOM BUILDINGS, BATH.

At the Bath City Council meeting held on the 5th inst. a letter was read from the President of the Royal Institute of British Architects asking for particulars as to how any contemplated scheme would affect the Roman Baths, remarking that his reason for doing so was owing to the great interest taken in these ancient works by all architects, antiquarians, and students of English art and history.

Letters were also received from the Bath Abbey Council, and also from the Old Bath Preservation Society.

Mr. T. Sturge Cotterell, the chairman of the attractions committee, in moving the adoption of the minutes, stated that the committee had not yet formulated any scheme, but were dealing only with the accommodation the site of the old *Chronicle* office would afford if it was decided to erect a building thereon adjoining the Roman Baths. The letters received would be considered with the great respect which they deserved, but he should like to assure all those interested that the safety of the Abbey and the preservation of the Roman antiquities, and any further antiquities that might be found during the excavation, would be treated by the committee as of paramount importance, and every consideration would be paid to the views expressed in the letters received and by the President of the Royal Institute of British Architects.

## VARIETIES.

A new girls' school at a cost of 3,000*l.* is being erected at Rusthall, near Tunbridge Wells.

It has been decided to build a public hall at Brookfield, a suburb of Johnstone, N.B.

Mr. William Cowie, architect, Ayr, has prepared for the Prestwich Town Council plans for a kiosk and stand to cost 900*l.*

Mr. Edward Shewbrooks, of Newcastle, architect, left estate of the gross value of 22,186*l.* 14*s.* 3*d.*, of which the net personalty has been sworn at 609*l.* 6*s.* 1*d.*

Leith Town Council have resolved to obtain from their surveyor a plan of a hall and library which it is proposed to erect at the entrance to the tramway depôt, Leith Walk.

Mr. B. Ball, the borough surveyor of Nelson, has resigned his position, having accepted an appointment at Singapore. It has been decided to advertise for a successor at 300*l.* per annum.

The Stoke-on-Trent Guardians have adopted plans for the proposed new offices and board-room to be erected adjoining the present Union buildings at a cost of 7,500*l.*

A scheme of addition and reconstruction at Westgreen Asylum, Dundee, involving an expenditure of 3,000*l.*, is under consideration, providing accommodation for eighty patients, and improved house room for the nursing staff.

The Brazilian Minister of Communications is expected to shortly issue a call for tenders for the construction of a building in Porto Alegre for the housing of the postal and telegraph service of that town. The estimated cost of the work is said to amount to about 45,250*l.*

Mr. William Owen, a well-known Warrington architect, died on Monday last suddenly. Mr. Owen designed many of Warrington's public buildings, and he was also responsible, in collaboration with Mr. Segar Owen, for the designing and carrying out of many of the buildings at Port Sunlight for Messrs. Lever Bros., of which firm he was a director.

The Privy Council have approved the new by-laws of the Royal Institute of British Architects, as revised by the general meetings of February 7 and 15, 1910, with the exception of the new by-law 24. They have substituted for this the old by-law 22, with the addition of the Licentiates, and they have asked the Council to submit an amended form of words with reference to the action to be taken towards members who take part in competitions against the wish of the Council. This amendment will be taken into consideration by the Council without loss of time, and their recommendations will be submitted to the general body.

The next ordinary meeting of the Paint and Varnish Society will be held at St. Bride's Institute on April 14, when Mr. Gaston Depierres (the President) will read a paper on "Zinc Oxide." The latest information concerning zinc oxide, its manufacture and properties, will be dealt with. All those interested in the subject will be welcomed.

The Stockport Corporation isolation hospital at Dialstone Lane is to be extended at an estimated cost of 16,000*l.* The Finance Committee have decided to apply to the Local Government Board for sanction to borrow the money required.

The re-erection of Crosby Hall, formerly in the City of London, on the site of More's garden in Chelsea, is expected to be completed by the end of June. The opening ceremony is to be followed in the first week in July by a pageant representing the outstanding episodes of its history.

The details of the plans of the Alhambra Music Hall, to be erected on the site of the Waterloo Rooms, Glasgow, have now been practically arranged, and it is expected that building operations will be commenced in the course of the next few weeks. When completed the music hall will provide seating accommodation on the ground floor and two galleries for about 2,400 people.

A memorial window to the late Mr. G. F. Deacon, engineer, who largely contributed to the inauguration of Liverpool's water supply from Lake Vyrnwy, has been placed in Llanwddyn Church, which the Corporation erected as a recompense for the old edifice now lying beneath the waters of Lake Vyrnwy. The main feature of it is a representation of "Moses striking the Rock."

Wednesday, June 15, has been provisionally fixed as the date of the reopening of Ayr Auld Brig, and it is understood that the Town Council have decided to invite the Earl of Rosebery, whose oration in the town hall in September 1906 was mainly instrumental in the raising of the 10,000*l.* required for the carrying out of the preservative work, to take a leading part in the ceremony.

The annual general meeting of the Glasgow Institute of Architects (Associate Section) was held in the rooms on March 27. A very satisfactory report was read and approved, and the following committee was elected:—Messrs. A. M. Gardner, A. Wright, J. Wright, H. Higgans, E. G. Wyllie, T. Lunan, J. A. Wilson, Alex. Davie, William Vickers, junr., and A. Newton. Mr. Alex. Wright was appointed chairman, and Mr. J. A. Wilson, 92 Bath Street, was again elected hon. secretary.

Dundee Corporation's outlays in connection with the Mackison case litigation will come to about 4,000*l.* Treasurer Soutar at a recent meeting remarked that the importance of the action to the town did not merely consist in the fact that the Council got rid of an action for 15,000*l.*, but that, in gaining the decision, it had also disposed of a dozen other claims of a similar kind that were lurking behind it. The whole cost of the litigation to the town would not be more than the sum of 4,000*l.*, which was tendered at a certain stage in the litigation.

A Durer exhibition, under the auspices of the Liverpool City Council, will be opened on the 16th inst. The exhibition will be one of quite exceptional interest, containing a practically complete collection, in chronological order, of reproductions of the life work of the great German mediæval painter and engraver, Albrecht Dürer. This collection, numbering about 1,000 items, has been formed by Sir Martin Conway, who has lent it for the purposes of the exhibition.

Sir Aston Webb, the assessor in connection with the adjudication of the plans for the Usher Hall, held a meeting with Lord Provost Brown, Dean of Guild Carter, several town councillors, and the town clerk, last week, in the City Chambers, at which there were discussed and approved the conditions bearing on the designs competition for the hall. Sir Aston also inspected the site which has been selected for the hall. The conditions of the competition for designs will be issued in a very few days.

*Indian Engineering* (Calcutta) states that the trustees of the Victoria Memorial to be built at Calcutta have accepted the tender of a firm at that city for the execution of the work. The building, which will take some eight years to complete, is estimated to cost 50,00,000 rupees (about 333,000*l.*). The structure is to be of brick, faced with white marble slabs from Jodhpur. The name and address of the firm who have been given the contract may be obtained on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

The Royal Institute of the Architects of Ireland held an ordinary meeting of the Council at 31 South Frederick Street, Dublin, on Monday, Mr. R. Caulfeild Orpen, B.A., occupying the chair in the absence of the President. A communication from the Stone Carvers' Trade Association with regard to the encouragement of the trade was considered, and the Council expressed themselves generally in favour of the Association's proposals. The amalgamation of the Architectural Association and the Institute was further discussed, and a proposal to erect a memorial to the late Sir Thomas Drew was under consideration.

At the last meeting of the heritors of the parish of Dunfermline, attention was called to the condition of the masonry of the more modern part of the abbey. It was stated that Sir R. Rowand Anderson had expressed the opinion that the position of matters was becoming serious. It was agreed that a credit balance of 50*l.* on last year's account should be applied to some scheme of restoration. It was pointed out by the Dean of the Guildry that not only was the quality of many of the stones inferior, but several of them had been laid the wrong way, and he remarked that a much bigger job might be involved than some of them anticipated.

The Admiralty have written to Greenock Corporation asking them to proceed with a building scheme to meet the requirements of the workers coming from Woolwich to the Clyde Torpedo Factory. While prepared to give their moral support to the scheme, the Admiralty states that the men cannot offer any guarantee as to the length of time they would continue in the houses. At a subsequent meeting of the law and finance committee it was unanimously agreed that should the Admiralty proceed with any such scheme the Corporation would give it their moral support, but that as there was no money in hand for providing houses they could not embark on an undertaking of this kind.

The Conway Suspension Bridge became free of tolls upon foot passengers at midnight, March 31, and in all probability will for the future always remain so. The Act of Parliament authorising the bridge to be built was passed in the reign of George IV. in 1821, and it was opened five years later. It passed into the control of the Conway Town Council in 1878. The Council undertook to maintain the bridge, and to set aside the profits from the tolls in a reserve fund. When that fund amounted to 10,000*l.*, they bound themselves to abolish the tolls, and to maintain the structure out of the income from the reserve fund. The reserve now stands at 8,000*l.* Reduced tolls will therefore be charged on vehicles, animals, &c.

The London Master Builders' Association held a council meeting recently, when it was decided to protest against the charges proposed to be made by the Port of London on building materials entering the Port. The Board of Trade will be asked to receive a deputation on the subject. It was also decided that members who may be engaged in litigation arising out of the conduct of their business could not rely upon the Council rendering financial assistance from the funds of the Association, unless the particulars relating to the dispute were submitted to the Council for their consideration, so that the question of whether or not financial assistance could be afforded should be decided by the Council beforehand.

The *Gaceta de Madrid* of March 23 announces a competition of plans, specifications, and estimates for the construction of a central market at Valencia, the cost of which must not exceed 2,000,000 pesetas (about 74,000*l.*). The plans and estimates must be submitted, within 150 days from the date of the *Gaceta*, to "El Señor Alcalde Presidente, Alcaldía Constitucional," Valencia. The successful competitor will enjoy certain preferential rights in the subsequent call for tenders for the execution of the works, and if such rights are relinquished he will be entitled to a premium of 25,000 pesetas (about 930*l.*). One of the conditions is that plans must be previously approved by a Spanish architect. The *Gaceta*, containing further particulars, may be seen by British firms at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

In connection with the Lancashire, Cheshire, and North Wales Building Trades Employers' Federation and the Lancashire and Cheshire Federation of Slate Merchants and Slaters a meeting, representing the whole of the slate trade in Lancashire and Cheshire, is to be held in Manchester on Thursday, April 14, "to protest against wholesale agents of the two great Welsh slate quarries continuing to compete for anything and everything in the way of slating and roof tiling, and to ask the quarry owners to consider the interests of the smaller men by actively discouraging these unfair operations on the part of their wholesale agents." The following resolution will be submitted:—"That this joint meeting of all the slate merchants and slaters, associated and otherwise, in the two counties of Lancashire and Cheshire, again express to the slate quarry owners the desirability of the old Lancashire custom being respected by their agents, and that the wholesale slate merchants shall confine their business strictly to the sale only of slates, and that neither directly nor indirectly will they compete for slating, but refer all inquiries for slating fixed complete to the local master slaters in the districts where the slating is required."

THE

# Architect and Contract Reporter.

FRIDAY, APRIL 15, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d.* *All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

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*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

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## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

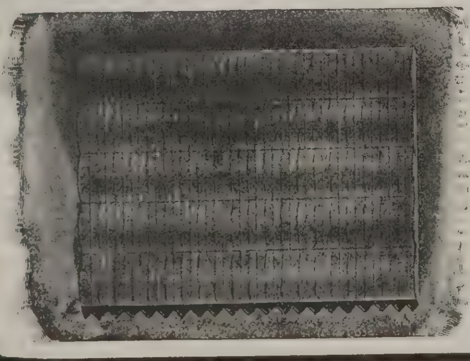
Birkenhead.—The Guardians invite architects residing within the limits of the Birkenhead Union to submit designs for a Children's Receiving Home. Premiums will be awarded for the three first designs. Mr. J. Carter, clerk, Poor Law Offices, Birkenhead.

Edinburgh.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—April 23.—The Meath County Council invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Apply to Mr. H. J. Cullen, Meath County Council Offices, Navan.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.



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## CONTRACTS OPEN.

Aislaby.—For erection of a cottage at Aislaby, Whitby. Mr. A. E. Young, architect and surveyor, 77 Baxtergate, Whitby.

Armley.—For the various works required in the erection of extension to works, Canal Road, Armley, Leeds, for Messrs. J. W. Roberts, Ltd. Mr. G. Fredk. Bowman, architect, 5 Greek Street, Leeds.

Barnsley.—April 20.—For pulling down the Dearne Grove Inn and three adjoining cottages, Hoyle Mill, and for rebuilding the inn, with stabling, &c. Messrs. R. & W. Dixon, architects, 5 Eastgate, Barnsley.

Barrow-in-Furness.—April 22.—For alterations to the borough treasurer's department, Town Hall. The Borough Engineer's Office.

Birkenhead.—April 26.—For erection of a sorting office, Rock Ferry. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

Birkenhead.—April 25.—For the construction and completion of an underground convenience and lavatory in the Market Square and Hamilton Street. Deposit 1*l.* Mr. Charles Brownridge, M.I.C.E., borough engineer and surveyor, Town Hall, Birkenhead.

Blacker Hill.—April 20.—For the whole or any part of the work required in erection of four houses at Blacker Hill, Yorks. Mr. Arthur Whitaker, architect, Worsbrough Bridge.

Bridgend.—May 7.—For erection of a board room and offices at the Workhouse. Mr. P. J. Thomas, architect, Bridgend.

Bridgwater.—April 19.—For the taking down and rebuilding of a wall abutting the roadside in the village of Cannington, for the Bridgwater Rural District Council. Mr. W. Alex. Collins, surveyor, 56a Eastover.

Budleigh Salterton.—April 20.—For new billiard room and various alterations and additions at the Club. Mr. Ernest E. Ellis, architect, Exmouth.

Canterbury.—April 23.—For the execution of works in connection with the proposed extension of the School of Art. Deposit 5*l.* Messrs. Jennings & Gray, architects, 4 St. Margaret's Street, Canterbury.

Chelmsford.—April 26.—For the execution of the following works in the Cattle Market:—(1) Construction of roof over Messrs. Rodd & Slipper's stand; (2) construction of a roof over Messrs. Offin & Rumsey's auction ring; (3) erection of a small horse shed of corrugated iron; (4) fixing new manger in and repairing existing horse shed. The Borough Surveyor's Office, 16 London Road, Chelmsford.

Cheltenham.—April 19.—For alterations and additions at the branch, Bath Road, Cheltenham, for the Gloucester Co-operative and Industrial Society, Ltd. Mr. Thomas Malvern, architect, 21 Winchcombe Street, Cheltenham.

Cove.—April 25.—For erection of a Council school for 140 children at Cove, near Farnborough. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Crewe.—April 27.—For erection of a sorting office, Crewe Station. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

Dunham Massey.—April 19.—For taking down Covershaw Bridge, Dunham Massey, Cheshire, and widening existing arch 6 feet, with new parapet walls to both sides. Mr. John McD. McKenzie, Mossburn Buildings, Altrincham.

Durham.—April 26.—Sole tenders are invited for house in Durham. City Accountant's Office, 6 Saddler Street, Durham.

Egremont.—April 25.—For the several works required in converting buildings into Masonic Hall, and for building ante-rooms, lavatories, &c. Also for gutting and reconstructing dwelling house, erection of boundary wall, gates, &c. Mr. James Lowery, Secretary to the Trust, 59 Main Street, Egremont, Cumberland.

Ellesmere Port.—April 23.—For erection of County police buildings at Ellesmere Port, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Chester.

Erith.—April 18.—For erection of two additional wards and other extensions to the Erith Sanatorium, Little Heath, Belvedere. Deposit 2*l.* 2*s.* Mr. Harold Hind, surveyor, Council Offices, Erith, Kent.

Falmouth.—April 30.—For additions and alterations to the Falmouth Grammar School, the work including heating of the premises by hot water. Mr. Sampson Hill, architect, Green Lane, Redruth.

Frizington.—April 26.—For the various works required in erection of a dwelling house, Frizington, Cumberland. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

Glasgow.—April 26.—For clearing the site, putting in foundations, &c., in connection with the erection of a labour and telephone exchange in College Street, Glasgow. Mr. Kennedy, clerk of the works, General Post Office, Glasgow (Hanover Street entrance).

Glass Houghton.—April 28.—For (all trades only) in erection and completion of the new West Riding Hotel at Glass Houghton, near Castleford. Send names before April 21 to Mr. Ernest E. Pickersgill, architect, Brewery Offices, Pontefract.

Goodmayes.—April 30.—For carrying out alterations and additions, Little Heath House, Goodmayes Asylum, Essex. Deposit 1*l.* Mr. John G. Morley, borough engineer, Town Hall, West Ham.

Grimsby.—April 19.—For the renewal of floors at the Holme Hill Council school. Mr. H. C. Scaping, architect, Grimsby.

Grosmont.—For altering and part rebuilding of butcher's shop and other premises adjoining in Tunnel Road, Grosmont, near Whitby, Yorks. Mr. Thomas Dowson, architect and surveyor, 3a Flowergate, Whitby.

Halifax.—April 25.—For the various works required in alterations and additions to the Halifax Golf Club. Messrs. Utley, Hebblethwaite & Utley, architects, 10 Waterhouse Street, Halifax.

Hemsworth.—April 20.—For erection of 65 dwelling houses, &c., at Fitzwilliam Village, Hemsworth, Yorks., for the South Kirby, Featherstone and Hemsworth Collieries, Ltd. Deposit 1*l.* Send names by April 20 to Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford.

Hinckley.—For erection of a doctor's house and stabling. Messrs. Heaton & Walker, architects and surveyors, 3 The Borough, Hinckley.

Ireland.—April 19.—For erection of a residence and dispens ary at Ballycastle, for the use of the medical officer of the Cushendall Dispensary district. Mr. T. J. O'Neill, C.E., the Board Room, Ballycastle Workhouse.

Ireland.—April 25.—For station master's house at Keady, and two cottages at Goraghwood, for the Great Northern Railway Co. (Ireland). Mr. F. A. Campion, chief engineer, Amiens Street Terminus, Dublin, or the District Engineer, Belfast.

Ilford.—April 26.—For the erection of a block of offices at the Electricity Works, Ley Street. Deposit 2*l.* 2*s.* Mr. H. Shaw, M.I.C.E., engineer and surveyor, Town Hall, Ilford.

Keighley.—April 25.—For work required in erection of a foundry and machine works at Strong Close. Messrs. Moore & Crabtree, architects, York Chambers, Keighley.

Kendal.—April 22.—For erection of two semi-detached cottages, Colin Field Lane. Mr. John F. Curwen, F.R.I.B.A., F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Kingsbridge.—April 16.—For erection of a market hall and shop at Kingsbridge, Devon, for the Kingsbridge Feoffees. Mr. T. W. Latham, surveyor to the Trust.

Lazonby.—April 20.—For erection of a warehouse, &c. The Lazonby and District Co-operative Society, Ltd., Lazonby, Cumberland.

London.—April 16.—For alterations, &c., at Nos. 61 and 63 Hornsey Rise, N. (Receiving Homes). Deposit 2*l.* Mr. Howard Goodchild, architect, 409 Holloway Road, N.

Macclesfield.—For alterations at the General Infirmary. Mr. A. E. Hanrahan, secretary.

Natland.—April 22.—For the various works required (mason's and slater's work excepted) in erection of a residence at Natland, near Kendal. Mr. Stephen Shaw, F.R.I.B.A., architect, 45 Highgate, Kendal.

Rochdale.—April 20.—For the construction in ferro-concrete of a high-level road and coal store in connection with the gas works. Mr. T. Banbury Ball, the Manager at the Gas Works, Dane Street, Rochdale.

Royton, near Oldham.—April 20.—For the work comprised in the provision of shelters and other erections, asphalting of walks, and drainage of site in connection with the park and recreation ground, Radcliffe Street. Mr. Ernest Woodhouse, F.R.I.B.A., architect, 88 Mosley Street, Manchester.

Scotland.—For the iron and steel work required in connection with the erection of a public slaughter-house at Buckhaven. Deposit 1*l.* 1*s.* Mr. W. D. Telfer, burgh surveyor, Municipal Buildings, Buckhaven.

Seaforth.—April 25.—For erection of a secondary and technical school in Cambridge Road, Seaforth, Liverpool. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

St. Helens.—April 19.—For extension of the gallery in the assembly room at the Town Hall. Mr. Geo. J. C. Broom, M.I.C.E., borough engineer, St. Helens, Lancs.

Sedgefield.—April 20.—For new lodge at Sedgefield Village, co. Durham, for the Sedgefield burial joint committee. Mr. J. W. T. Richardson, M.S.A., architect and surveyor, 57 High Street, Stockton-on-Tees.

Selby.—For the various works required in the erection of three cottages in Flaxley Road, for the Selby Steam Laundry Co., Ltd.

Stretford.—April 18.—For the erection of a public elementary school at Gorse Hill, Stretford. Deposit 2l. 2s. Mr. Frank W. Mee, F.R.I.B.A., architect, 32 Victoria Street, Manchester.

Veryan.—April 23.—For erection of a cottage at Boswague Farm, Veryan, Cornwall. Mr. A. Ernest Harris, architect, 28 Boscawen Street, Truro.

Wales.—For the following works for the Rhyl Pier extension:—Contract No. 1, widening and encasing the present iron pier, constructing a jetty some 600 yards long to deep water, all in ferro-concrete; (2) erection and construction of a new assembly hall, visitors' club, numerous shops, tea rooms, and offices, sundry alterations to the present amphitheatre, all of which are to be built on terra firma and constructed of brick, &c.; (3) new dining room, refreshment room, kiosks, and shelters, to be erected on the pier proper, and will be constructed principally of wood, steel and cement. Deposit 1l. 1s. each contract. Messrs. Maxwell & Tuke, architects and engineers, 25 Brazenose Street, Manchester.

Wales.—April 18.—For erection of a new drill hall at Rhymney, Mon. Deposit 1l. 1s. Major H. A. Moore, secretary, Monmouthshire Territorial Force Association, 35 Stow Hill, Newport, Mon.

Wales.—April 18.—For the following works, for the Glamorgan County Council, viz.:—(1) New girls' department of the Council school at Bedlinog; (2) new infants' department of the Council school at Taibach, Port Talbot; (3) new higher elementary school at Caerphilly; (4) additions to the Brynnau Council school, near Llanharan; (5) cookery-room at the Council school at Dinas Powis; (6) new latrines at the Council school at Hengoed. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—April 19.—For erection of a Congregational chapel at Cwmgorse. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

Wales.—April 19. For erection of a police station at Bedwas, Mon. Deposit 1l. 1s. Mr. William Tanner, county surveyor, Newport.

Wales.—April 19.—For alterations and additions to the Cwmcarn Hotel, Cwmcarn, Mon. Deposit 2l. 2s. Mr. H. J. Griggs, A.R.I.B.A., architect, Metropolitan Bank Chambers, Newport, Mon.

Wales.—April 19.—For the following works for the Rhondda Urban District Council:—(1) Rebuilding the masonry boundary wall at the Fever Hospital, Ystrad-Rhondda; (2) improvement of Cornwall Road, Williamstown. Deposit 1l. 1s. each contract. The Council Offices, Pentre.

Wales.—April 21.—For new mixed and infants' school (346 places) and cookery kitchen at Builth Wells, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Wales.—April 22.—For the erection of a public abattoir, stabling and other works, at Pontypool. Deposit 2l. 2s. Mr. D. J. Lougher, architect and surveyor, Bank Chambers, Pontypool.

Wales.—April 23.—For alterations and additions to existing farmhouse, buildings and outbuildings, Mill Farm, Monknash, Glamorgan. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—April 25.—For erection of 14 semi-detached houses at Bedwas, for the Tydfil Road Building Club. Mr. Ralph Simmonds, architect and surveyor, Blackwood.

Wales.—April 25.—For erection of 16 houses, including sewers and lanes, at Senghenydd. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects, Church Street Chambers, Pontypridd.

Walton-on-Naze.—For the erection of new public elementary school at Walton-on-Naze, for the Essex education committee. Deposit 3l. 3s. Send names immediately to Messrs. Tomkins, Homer & Ley, architects, 54-5 Bishopsgate Street Without, London, E.C., and Frinton-on-Sea.

Wanstead.—May 4.—For the erection of a foreman's cottage at the Wanstead Sewage Farm, Empress Avenue, Manor Park. Deposit 1l. Mr. C. H. Bressey, surveyor, Council Offices, Wanstead, N.E.

Wath-upon-Dearn.—April 22.—The West Riding education committee invite whole or separate tenders for the following work:—Wath-upon-Dearn, Victoria provided school, erection of new senior mixed department (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1l. deposit to the West Riding Treasurer, County Hall, Wakefield.

West Stanley.—April 16.—For proposed banking premises, five shops, entertainment hall, &c., at West Stanley, Durham. Send in names by April 16 to Mr. John J. Eltringham, architect and surveyor, Derwent Street, Blackhill.

Wheatley.—For pair of semi-detached villas to be erected in Axholme Road, Wheatley, Doncaster. Send names to Mr. John Athron, architect, 10 Priory Place, Doncaster.

Whitehaven.—April 21.—For the various trades required in erection of two semi-detached houses at Mountain View. Messrs. J. S. Moffat & Bentley, architects, &c., 53 Church Street, Whitehaven.

Wigan.—April 27.—For the erection of the People's Palace and Opera House. Messrs. Heaton, Ralph & Heaton, architects, King Street, Wigan, Lancashire.

Woolwich.—April 27.—For additions, alterations and repairs to a mission hall in Francis Street, North Woolwich, to adapt it as a branch public library. Deposit 1l. 1s. Mr. J. Rush Dixon, M.I.C.E., borough engineer, Town Hall, Woolwich.

Worthing.—April 18.—For the erection of a cookery and manual instruction school in Richmond Road. The Borough Surveyor, Municipal Offices, Worthing.

# TENDERS.

## BRADFORD.

For erecting St. Clement's Vicarage, Barkerend Road. Mr. H. E. Priestley, architect and surveyor, Manningham, Bradford.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Booth & Son, excavator, mason, and bricklayer | £784 | 0 | 0 |
| Pickering, carpenter and joiner | 423 | 10 | 0 |
| Collinson, plumber and glazier | 200 | 0 | 0 |
| J. & W. Bates, plasterer | 129 | 0 | 0 |
| Smithies, slater | 55 | 17 | 6 |
| Smith, painter | 40 | 5 | 2 |

All of Bradford.

## BRIGHTON.

For painting the grand stand at the racecourse, for the Borough Council.

| | | | |
|---|---|---|---|
| J. & W. Simmonds | £725 | 0 | 0 |
| Read | 658 | 0 | 0 |
| Gates & Sons | 560 | 0 | 0 |
| Olliver & Son, Brighton (*accepted*) | 555 | 0 | 0 |

## BRITON FERRY.

For the erection of a public hall and institute. Mr. H. Alex. Clarke, architect, Briton Ferry.

| | | | |
|---|---|---|---|
| Willis | £7,852 | 14 | 0 |
| Goodridge & Sons | 6,998 | 0 | 0 |
| Gower | 6,962 | 0 | 0 |
| Cox | 6,790 | 0 | 0 |
| Jones & Thomas | 6,779 | 0 | 0 |
| D. Davies & Sons | 6,626 | 0 | 0 |
| Knox & Wells | 6,547 | 0 | 0 |
| Thompson & Co. | 6,527 | 10 | 0 |
| D. W. Davies & Howell | 6,500 | 0 | 0 |
| Broadfoot | 6,328 | 0 | 0 |
| Williams | 6,244 | 0 | 0 |
| Colborne | 6,199 | 0 | 0 |
| Radford & Greaves | 6,186 | 7 | 6 |
| Evans & Bros., Cardiff (*accepted*) | 6,141 | 0 | 0 |

## BRANDON.

For private street works at Railway Street, Brandon Colliery.

| | | | |
|---|---|---|---|
| White | £449 | 0 | 0 |
| Henderson | 438 | 0 | 0 |
| I. & R. Wood | 407 | 3 | 0 |
| Reavell | 386 | 14 | 8 |
| Walton, Crook (*accepted*) | 375 | 5 | 8 |
| Surveyor's estimate | 366 | 0 | 0 |

### BRENTWOOD.

For sewerage and sewage disposal works at Brentwood, Essex. Messrs. Willcox & Raikes, engineers, Birmingham.

| | | | |
|---|---|---|---|
| Nowell | £28,425 | 0 | 0 |
| Pedrette & Co. | 24,975 | 7 | 0 |
| Wilson, Border & Co. | 24,900 | 0 | 0 |
| T. & J. Carter | 24,780 | 0 | 0 |
| Shellabear & Son | 24,319 | 10 | 7 |
| Acme Paving Co. | 24,253 | 8 | 0 |
| Wright & Co. | 23,846 | 2 | 3 |
| Gibbons | 23,456 | 0 | 0 |
| Smith & Co. | 22,390 | 19 | 0 |
| Mowlem & Co. | 23,387 | 0 | 0 |
| Rowell & Sons | 22,312 | 18 | 4 |
| J. & T. Binns | 22.131 | 9 | 8 |
| Morley & Sons | 22,062 | 10 | 0 |
| Wimpey & Co. | 21,865 | 15 | 0 |
| Cousins | 21,749 | 1 | 11 |
| S. Wood | 21,621 | 0 | 5 |
| T. Wood & Sons | 21,604 | 16 | 9 |
| Lowe & Sons | 21,540 | 0 | 0 |
| Wickstead & Co. | 21,155 | 2 | 0 |
| Taylor | 21,107 | 11 | 7 |
| Muirhead & Co. | 21,099 | 0 | 0 |
| Osman | 21,000 | 0 | 0 |
| Brebner & Co. | 20,464 | 14 | 0 |
| Price & Co. | 20,358 | 8 | 8 |
| Davies, Ball & Co. | 20,342 | 0 | 0 |
| Jackson | 20,292 | 3 | 3 |
| Rayner | 20,253 | 0 | 0 |
| Iles | 20,100 | 0 | 0 |
| Johnson & Langley | 20,028 | 10 | 3 |
| Johnson Bros. | 19,952 | 0 | 0 |
| Nunn & Co. | 19,937 | 0 | 0 |
| Cunliffe & Sons | 19,740 | 0 | 0 |
| Moran & Sons | 19,690 | 0 | 0 |
| T. W. Pedrette | 19,670 | 0 | 0 |
| Mackay | 19,584 | 9 | 3 |
| Hardy & Co. | 19,180 | 0 | 0 |
| Farr | 18,946 | 0 | 0 |
| Bell & Sons | 18,691 | 0 | 0 |
| Vale & Sons | 18,600 | 0 | 0 |
| Firth & Co. | 18,100 | 0 | 0 |
| W. & C. French, Buckhurst Hill (*accepted*) | 18,040 | 13 | 3 |
| Engineer's estimate | 19,475 | 0 | 0 |

### CARLISLE.

For extensions to plant in the electricity station.

| | | | |
|---|---|---|---|
| *Engines, dynamos, &c.* | | | |
| Browett, Lindley & Co., Manchester | £4,460 | 0 | 0 |
| *Boilers, economisers, and pumps.* | | | |
| The Stirling Boiler Co., London | 3,359 | 0 | 0 |
| *Condensing plant.* | | | |
| Korting Bros., London | 398 | 0 | 0 |

### CIRENCESTER.

For the demolition of buildings adjoining the police station and the construction of a superintendent's house upon the site. Mr. E. S. Sinnott, M.I.C.E., county surveyor, Gloucester.

| | | | |
|---|---|---|---|
| Preece | £1.350 | 0 | 0 |
| Estcourt & Sons | 1,315 | 0 | 0 |
| Gluyas | 1,300 | 0 | 0 |
| Jones | 1,260 | 0 | 0 |
| Love | 1,229 | 0 | 0 |
| Orchard & Peer | 1,215 | 0 | 0 |
| Drew | 1,203 | 10 | 0 |
| Collins & Godfrey | 1,149 | 0 | 0 |
| Saunders & Sons | 1,140 | 0 | 0 |
| Dolman | 1,122 | 14 | 3 |
| G. F. & E. Newcombe | 1,107 | 0 | 0 |
| Colborne | 1,073 | 15 | 0 |
| Fleetwood | 1,058 | 10 | 4 |

### GATESHEAD.

For the erection of a sanatorium for the Board of Guardians at Shotley Bridge.

| | | | |
|---|---|---|---|
| Hall, Gateshead (*accepted*) | £4,498 | 0 | 0 |

For a complete system of warming and ventilation, a complete system of hot-water supply boilers and fittings, with economiser and steam services at the Asylum.

| | | | |
|---|---|---|---|
| Haden & Sons, Trowbridge (*accepted*) | £6,674 | 0 | 0 |

### DONINGTON.

For erection of an elementary school at Donington, for the Cowley's Charity, Donington, near Spalding. Mr. Jas. Rowell, architect, Boston.

| | | | |
|---|---|---|---|
| Tapster & Sharp | £1,081 | 0 | 0 |
| Banks & Son | 1,078 | 3 | 9 |
| Gilchrist | 1,060 | 0 | 0 |
| Pattinson & Sons | 1,050 | 0 | 0 |
| Wright & Son | 1,017 | 0 | 0 |
| Heath | 1,006 | 11 | 0 |
| Greenfield | 998 | 15 | 0 |
| Peck | 989 | 0 | 0 |
| Barnsdale | 983 | 0 | 0 |
| Mowbray | 953 | 0 | 0 |
| Parker & Son | 909 | 18 | 0 |
| Langley & Son, Kirton, near Boston (*accepted*) | 895 | 10 | 0 |

### GUILDFORD.

For erecting new premises, Haydon Place, for the Guildford and District Co-operative Society, Ltd. Mr. T. J. Capp, architect, Guildford.

| | | | |
|---|---|---|---|
| Smith & Sons | £2,700 | 0 | 0 |
| Johnson | 2,653 | 0 | 0 |
| Smith | 2,650 | 0 | 0 |
| Ellis | 2,637 | 0 | 0 |
| Billimore | 2,632 | 0 | 0 |
| Tribe & Robinson | 2,610 | 0 | 0 |
| Higlett & Hammond, Guildford (*accepted*) | 2,549 | 0 | 0 |

### ITCHEN.

For constructing a relief sewer.

| | | | |
|---|---|---|---|
| Grounds & Newton | £1,096 | 0 | 0 |
| Douglas, Portswood Avenue (*accepted*) | 929 | 0 | 0 |

### LONDON.

For repairs to dwellings, for the Chelsea Borough Council.

| | | | |
|---|---|---|---|
| Bannerman & Sons | £724 | 8 | 0 |
| Woollaston Bros. | 720 | 0 | 0 |
| Noorgard & Son | 647 | 0 | 0 |
| Davies | 625 | 0 | 0 |
| Squire | 501 | 0 | 0 |
| Gathercole Bros. | 499 | 0 | 0 |
| Webster & Son | 467 | 0 | 0 |
| Adams | 409 | 2 | 0 |
| Nightingale, Albert Embankment (*recommended*) | 382 | 0 | 0 |
| McCarthy | 352 | 10 | 0 |

### NUNEATON.

For the labour only in excavating for and laying (not pipe-jointing) about 975 yards of 10-inch and 350 yards of 12-inch cast-iron pipes and 1,400 yards of 12-inch steel tubes, for the Town Council. Mr. F. C. Cook, A.M.I.C.E., borough engineer.

| | | | |
|---|---|---|---|
| Kelley & Son | £823 | 7 | 7 |
| Mitchell & Son | 806 | 5 | 0 |
| Hyslop | 755 | 12 | 6 |
| Chamberlain | 699 | 1 | 0 |
| Palmer | 668 | 0 | 0 |
| Clark | 641 | 17 | 0 |
| Bennie & Thompson | 623 | 8 | 8 |
| Downham | 438 | 5 | 6 |
| Brebner & Co. | 419 | 6 | 9 |
| Brown, Nuneaton (*accepted*) | 407 | 4 | 1 |

### PRESTWICH.

For the whole of the work required in the erection of kitchens, stores and bakery, and other alterations to the administrative department at the County Lunatic Asylum, Prestwich, Lancs. Mr. Thomas Chadwick, A.R.I.B.A., architect, Manchester.

| | | | |
|---|---|---|---|
| Dawson | £9,170 | 0 | 0 |
| Normanton & Son | 8,385 | 0 | 0 |
| Gerrard & Son | 8,337 | 0 | 0 |
| Burgess & Galt | 8,233 | 0 | 0 |
| Neill & Sons | 8,190 | 0 | 0 |
| Leach & Son | 8,187 | 0 | 0 |
| Ramsbottom | 8,150 | 0 | 0 |
| Partington | 8,140 | 0 | 0 |
| Megarity & Co. | 8,138 | 0 | 0 |
| Young, Tinker & Young | 8,023 | 0 | 0 |
| Macfarlane & Son | 7,960 | 0 | 0 |
| Tinline | 7,920 | 0 | 0 |
| Carlyle, Old Trafford (*recommended*) | 7,781 | 0 | 0 |

## SCOTLAND.

For the carpenter, plumber, plasterer, slater, and painter and glazier works of new laundry and cookery rooms at Inverurie school. Mr. Geo. Gray, architect, Inverurie.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Duncan, Inverurie, mason | £443 | 5 | 3 |
| Buchan, Inverurie, carpenter | 302 | 19 | 0 |
| Blaikie & Sons, Aberdeen, plumber | 257 | 10 | 0 |
| Rhind, Inverurie, slater | 58 | 7 | 0 |
| Grant & Robertson, Inverurie, plasterer | 45 | 15 | 6 |
| Maitland & Ross, Inverurie, painter | 19 | 14 | 0 |

## UPPINGHAM.

For the erection of Uppingham International Stores. Messrs. G. Baines & Sons, architects, 5 Clement's Inn, W.C.

*Estimate A.*

| | | | |
|---|---|---|---|
| Theobald & Sons | £488 | 0 | 0 |
| Hayes & Sons | 443 | 0 | 0 |
| Maxey & Son | 404 | 0 | 0 |
| Thackeray & Co. | 384 | 17 | 7 |
| Coulson & Lofts | 382 | 0 | 0 |
| Mason & Son (*accepted*) | 345 | 0 | 0 |

*Estimate B.*

| | | | |
|---|---|---|---|
| Theobald & Sons | 130 | 0 | 0 |
| Thackeray & Co. | 111 | 15 | 0 |
| Hayes & Sons | 107 | 0 | 0 |
| Maxey & Son | 99 | 0 | 0 |
| Coulson & Lofts | 92 | 0 | 0 |
| Mason & Son (*accepted*) | 75 | 10 | 0 |

*Estimate C.*

| | | | |
|---|---|---|---|
| Theobald & Sons | 290 | 0 | 0 |
| Maxey & Son | 230 | 0 | 0 |
| Thackeray & Co. | 222 | 9 | 7 |
| Hayes & Sons | 218 | 0 | 0 |
| Coulson & Lofts | 214 | 0 | 0 |
| Mason & Son (*accepted*) | 172 | 0 | 0 |

## WALES.

For erection of a club house at Radyr, for the committee of the Golf Club, Radyr. Mr. H. Snell, architect, Hickman Road, Penarth.

| | | | |
|---|---|---|---|
| D. Davies & Sons | £4,103 | 0 | 0 |
| Pittard | 4,095 | 0 | 0 |
| Totterdell | 3,997 | 19 | 3 |
| Harry | 3,996 | 13 | 6 |
| Allan & Co. | 3,924 | 12 | 2 |
| Griffith & Son | 3,902 | 8 | 3 |
| Evans | 3,891 | 11 | 9 |
| Maggs | 3,849 | 10 | 0 |
| Turner & Son | 3,785 | 0 | 0 |
| Jones | 3,598 | 0 | 0 |
| Morgan | 3,594 | 0 | 0 |
| Bowers & Co. | 3,565 | 0 | 0 |
| Knox & Wells, Cardiff (*accepted*) | 3,525 | 0 | 0 |
| D. W. Davies & Howell | 3,456 | 0 | 0 |

## COMPETITIONS.

Blyth.—The Governors of the Blyth Secondary School recently instituted a competition among local architects for designs for a new Secondary school for 280 pupils with a caretaker's cottage at a cost of 7,000*l.*, to be erected in Plessy Road. Mr. J. A. Gotch, F.R.I.B.A., F.S.A., was appointed adjudicator, and has made the following awards:—1st prize, Mr. Edward Cratney, Wallsend; 2nd, Messrs. W. & F. R. Milburn, Sunderland; 3rd, Messrs. Shewbrooks & Hodges, Newcastle.

Bromley.—Mr. C. H. B. Quennell, F.R.I.B.A., has been awarded the first place in the limited competition for church schools at Masons' Hill, Bromley, Kent, for his design marked "D," and he has been appointed architect for the erection of the schools. An honorarium of 20 guineas has been awarded to Messrs. Russell & Cooper, FF.R.I.B.A., for design "A"; and an honorarium of 10 guineas will be paid to the other competitors. The designs are hung in the Art School, Bromley. Mr. H. P. Burke Downing, F.R.I.B.A., acted as assessor.

The Local Government Board have sanctioned the proposed drainage scheme at Emsworth prepared by Messrs. W. B. G. Bennett & Son, M.Inst.C.E., of Southampton. The scheme, which is estimated to cost over 20,000*l.*, was selected out of thirty others submitted in competition. Messrs. Bennett were awarded the first premium of 100*l.*, and have now been appointed engineers by the Council to carry out the works.

## THE IDEAL HOME EXHIBITION.

The exhibition at Olympia, which was opened last Friday, suggests that there must be several kinds or degrees of an ideal home, or perhaps the visitor is intended to make a selection of what he is shown, and out of that to create his ideal. The promoters fortunately recognised that a most important part in affording its inmates the greatest happiness is played by the dwelling itself and its appointments. Thus the heart of the exhibition is "The Central House." This is placed in the centre of the arena, and from it radiate something after the manner of a Union Jack the splendidly broad approaches. This 600*l.* house was, of course, erected in situ in a few days by Messrs. Holloway Bros., from the designs of Mr. W. Rupert Davison, architect, and it has proved one of the greatest attractions. It seems a pity that advantage cannot be taken to while away the tedium of the people waiting for admission in a queue outside the garden enclosure by a series of ten minute lectures on the appreciation of domestic architecture or kindred subjects. The house was given the most prominent position, and it has the additional attraction of having been put up in a few days—though not, as one visitor declared, in two. The interior shows the ideal house ideally furnished for 350*l.* The next most popular exhibit, though whether it would be an ideal feature in the Central House we would not like to say, is up in the gallery. It consists of babies. The toddlers certainly seem very charming in Stalls 60, 61, 62. If the ideal of the visitor is not yet satisfied he may find better luck in the food and cookery section, or the sections for music and recreation, hygiene and furnishing. Should he still feel that he has not even yet seen enough to answer his most exacting demands, he should turn to the Tudor Village, or to the two sections adjoining each other, devoted to heating and lighting, construction and decoration.

If the order of the catalogue is followed, one of the first stalls in this division is No. 32, where *Messrs. Sissons Bros. & Co.* show how pleasant and yet simple the walls of a room can be made to look with Hall's Distemper. The woodwork has been treated with their "Orientolac" and "Sisco." The colours are so soft, even and flat, that the small gilt oval mirror appears to be somewhat undesirable as breaking into the perfect harmony. Not far off is the good-sized pavilion erected by the *Silicate Paint Co.* (J. B. Orr & Co., Ltd.), to show the effects obtainable with their washable water paint "Duresco," and with Charlton Imperial zinc white for the interior woodwork. The qualities especially claimed for "Duresco" are its beautiful surface, and that it is durable, damp-resisting, non-poisonous and antiseptic, besides, of course, being washable. The makers emphasise that "Duresco" must not be made thin, 1 cwt. requiring to be broken up and thoroughly mixed and diluted with 1½ gallons of petrifying liquid. They also say that the touching up of the first coat is of the utmost importance. Another exhibit of an allied nature is the stand of *Messrs. Arthur Sanderson & Co.*, who in addition to some fine wall papers show "Paripan" enamel and "Wal-Pa-Mur"—the latter being offered as a cheaper alternative to "Paripan."

*Messrs. Wm. Duncan, Tucker & Sons, Ltd.*, are showing some of their aids to horticulture, such as an ingeniously fitted span-roof greenhouse, a "Caloricult" structure for intensive fruit culture, a span-roof garden frame plant preserver, and a garden tea house. Messrs. Duncan, Tucker & Sons enjoy a high reputation for this class of work, as well as for joinery in general.

The *British Cork Asphalte, Ltd.*, so to speak, bring forward the domestic side of their business more prominently than in the ordinary building exhibition, where the public works' side is rightly given prominence. Samples of products like Corketa, Corkite, and Corkadamant, are shown under ornamental guises, where their full utilitarian advantages are enjoyed with the addition of a pleasing appearance. The effects obtainable in Corkadamant call for attention.

*Messrs. Hammond & Champness, Ltd.*, are showing for the first time an electric service lift, in which the entire mechanism is attached to the lower part of the cage, i.e., it ascends and descends with it. The lift is controlled by push buttons, and in ascending through the floor it raises a trap door, which on the return journey is replaced exactly. This saves the necessity for any enclosure in the dining room. The service lift is of course very compact with its absence of all the usual gear. They also show their safety invalid lift, in which the invalid is enabled to haul himself up by a hand-rope with an astonishingly infinitesimal amount of exertion; as well as a hand power service lift, and some plant.

*Messrs. Oetzmann & Co., Ltd.*, have completely furnished a two-storey cottage. Their endeavour was to secure that everything should be in scale with the size of the cottage and in good taste. While each room has its distinctive colour scheme they all combine well together. The amount that can be done for a small sum when judiciously laid out will come as a surprise to most visitors. Considerably over a third of the cost of completely fitting and furnishing the whole seven rooms is expended on the best bedroom.

A most essential constituent of an ideal home is undoubtedly the fire. It would, we believe, be impossible for most Englishmen to conjure up an ideal home without including a cosy, comforting fireplace. Owing to national conservatism the form of it might possibly be in some cases an old-fashioned one that was far from the best. However, the majority who have experienced the vast improvements effected of late in the domestic hearth would no doubt picture one of the modern grates. There are a number of patent fires at Olympia including the "Devon," the "Tilt," the "Heaped" and the "Burkone."

The *Standard Range and Foundry Co., Ltd.*, in addition to exhibiting the "Burkone," have brought together a display of electrical, gas fittings, and general metal work, chimney pieces and ranges. Their latest self-setting range may be seen at work cooking. The feature of it is that the flame passes direct over the top of the boiler so that hot water is obtained in the shortest possible time, and in addition the flues are so constructed that the cook can have either direct heat to the bottom, or top and side heat for roasting. Another detail is the air regulator at the chimney base. On the stand is a new type of independent boiler for domestic hot water. The difficulty of obtaining a satisfactory supply all the year round is known to all; the new boiler, which is about to be put on the market, has come to solve the problem. It is fitted with a magazine which accommodates the 30 lb. of fuel necessary for twelve hours' burning without attention; during that time it will provide 20 gallons of boiling water per hour at a cost of 2*d*. per 12 hours. This boiler can be fitted to any water-supply system. The company recently took over extensive works for the production of wrought iron and copper work. The goods here exhibited are conspicuous for their design, execution, and ingenuity. For the latter we need only mention the combined electric table lamp and wall bracket. For specimens of design and execution the visitor should examine the wrought iron grille or the grotesques. Pride of place on the stand is given to the firm's "Burkone" fire. The patent consists of a solid fire-brick back, the bottom portion of which is modelled in the shape of a basin; in the centre of this is an iron cone through which the air enters into the heart of the coal, ensuring a brilliant slow combustion fire and perfect radiation. Owners of small property and others should see the "Municipal combined heating and cooking stove," which has been still further improved. The Standard Range and Foundry Co., Ltd., have their London show rooms at 106 Bond Street, W.

*Messrs. Candy & Co., Ltd.*, display specimens of the "Devon" fire in glazed briquette work, tiles, faïence and marble, as well as wood chimney pieces. In the 1908 Ideal Home Exhibition the "Devon" fire was selected in a competition as being the ideal fireplace for five rooms out of a possible seven.

The "Heaped" fire is shown in action at Stall 77, by *Messrs. Bratt, Colbran & Co.*, where it throws out a most convincing heat. It may be mentioned that "Heaped" fires have been introduced in the living room and parlour of the Central House, as being simple in construction, with no working parts to get out of order, and as throwing out the largest possible amount of heat. The architect says "it would be difficult to find a more satisfactory form of fire." The coal, it will be remembered, rests on a loose raised tray; the draught is controlled by the economiser. There are no bars in front to absorb the heat.

The *Coalbrookdale Co., Ltd.*, contribute the "Tilt" fire, in which the fire basket can be turned on a pivot when a strong draught is required, as at the time of lighting or when the fire has accidentally burnt nearly out.

On Stall 13 (*H. C. Cleaver, Ltd.*) is the new kind of anthracite stove manufactured by the Well Fire and Foundry Co., Ltd., 21 Berners Street, W., which is a distinct advance on the old patterns. It is easily lighted, continuous burning, and under perfect control.

The *Carron Company* have given up the greater part of the space to their latest range, which is of extra heavy make. The transparent inner door to the oven should receive a great welcome from cooks, who can inspect everything inside without danger of spoiling them. The range is a handsome one and contains many facilities for satisfactory working. On the stand there is also a small selection of their beautiful fire-grates.

*Messrs. Higgs & Hill* show their hospital furniture, joinery, &c. A special feature is the oak panelling which is made from well-seasoned wood. It is made hand or machine-finished as ordered. Included on the stand are goods by W. P. Corby & Co., who make a speciality of baths, sinks, urinals, and underground conveniences. A small fitting which will repay is the Patent Hygienic Lavatory Towel.

*Messrs. Newton, Chambers & Co.* exhibit "Izal," a disinfectant which is made up as a fluid, powder, soap, and various toilet preparations. It is a non-poisonous germicide which may be beneficially used for a very large number of purposes.

*Messrs. T. & R. Boote, Ltd.*, have a well arranged exhibit of tiles and pottery, which suggests the way in which tiling as now manufactured lends itself to decorative effect. The firm commenced making them over half a century ago, and have ever since been in the vanguard of the trade.

*Messrs. Waring & Gillow, Ltd.*, arranged their large space as a series of furnished rooms, without any fronts. The harmony of each compartment is quite refreshing to a visitor who has toured the exhibition. The furniture displayed makes no pretence at being cheap or of a makeshift character. It is of a kind that would be suitable to any sized house, for it derives its effect from design and colour rather than by size.

To exhibit in the Tudor Village it was necessary that the firm represented should have been in continuous existence for at least a century. This condition is fulfilled by *Messrs. Thos. Parsons & Sons*, who are to be found at "The Old Varnish House." Their business as varnish manufacturers was established in 1802; for a number of years carriage builders were their chief or only customers. But for at least twenty years past the firm have been devoting attention to the house decorator's requirements, and now produce an array of specialities like Endelline gloss white enamel, Endellflat enamel, and Lacquerite. The interior of "The Old Varnish House" shows the effects produced by working on Elite plaster.

A feature of the village is the quaint fire-station of the *Phœnix Assurance Co., Ltd.* In it are two of Merryweather's engines, one from Windsor Castle and the other from St. James's Palace. Since the Phœnix was established in the Langbourn Ward Coffee House, London, by a number of sugar bakers or refiners in 1781, they have paid away in claims no less a sum than seventy million pounds.

## BOLTON PRIORY, YORKS.

Bolton Priory, or Bolton Abbey as it is better known locally, was a priory of the Austin Canons, being founded at Embsay in 1120, and afterwards transferred to Bolton.

Here in this stately old pile may be found work of all periods from Transitional Norman to Perpendicular, it being commenced in 1151.

The only parts remaining of the Transitional Norman work are the lower parts of the choir and parts of the south transept and nave, the chief portion of the nave having been rebuilt in the Early English style, and the east end of the choir in the Decorated style.

The church was originally aisleless, but one was added later on the north side, the cloisters probably being the reason why one was not also added on the south side, and to partly balance this the nave, on the cloister side, was pulled down as far as the roof of the cloisters and six fine windows added as far as the length of the arcade.

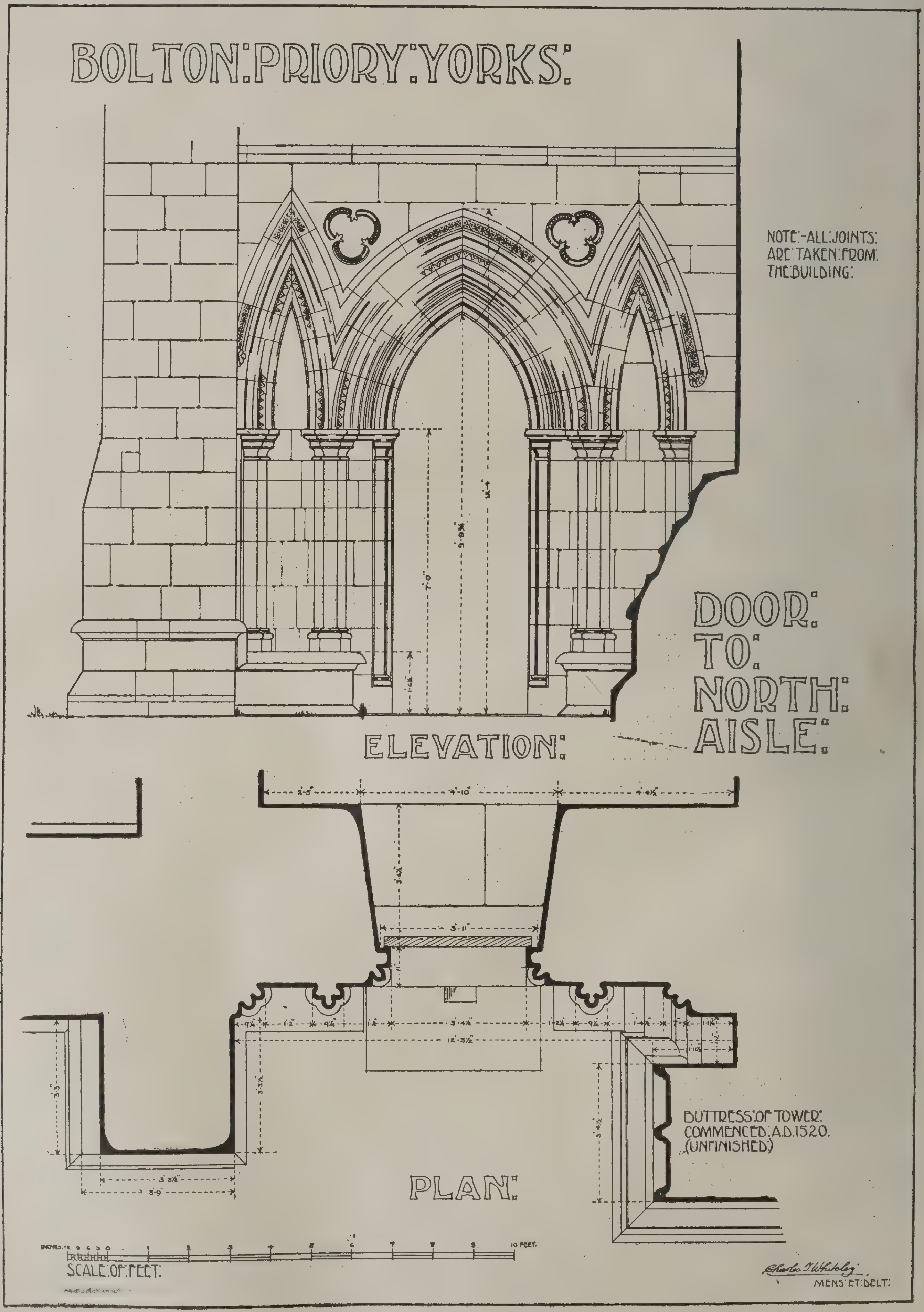
The choir and transepts were rebuilt in the fourteenth century almost from the foundations.

In 1520 a fine Perpendicular tower was commenced, but it had only reached a third of its height at the time of the suppression of the monasteries in 1536-9. Of the domestic buildings of the priory little remain except foundations. The cloister was small and had the usual doors to the nave and south transept. Only the foundations of the chapter-house remain.

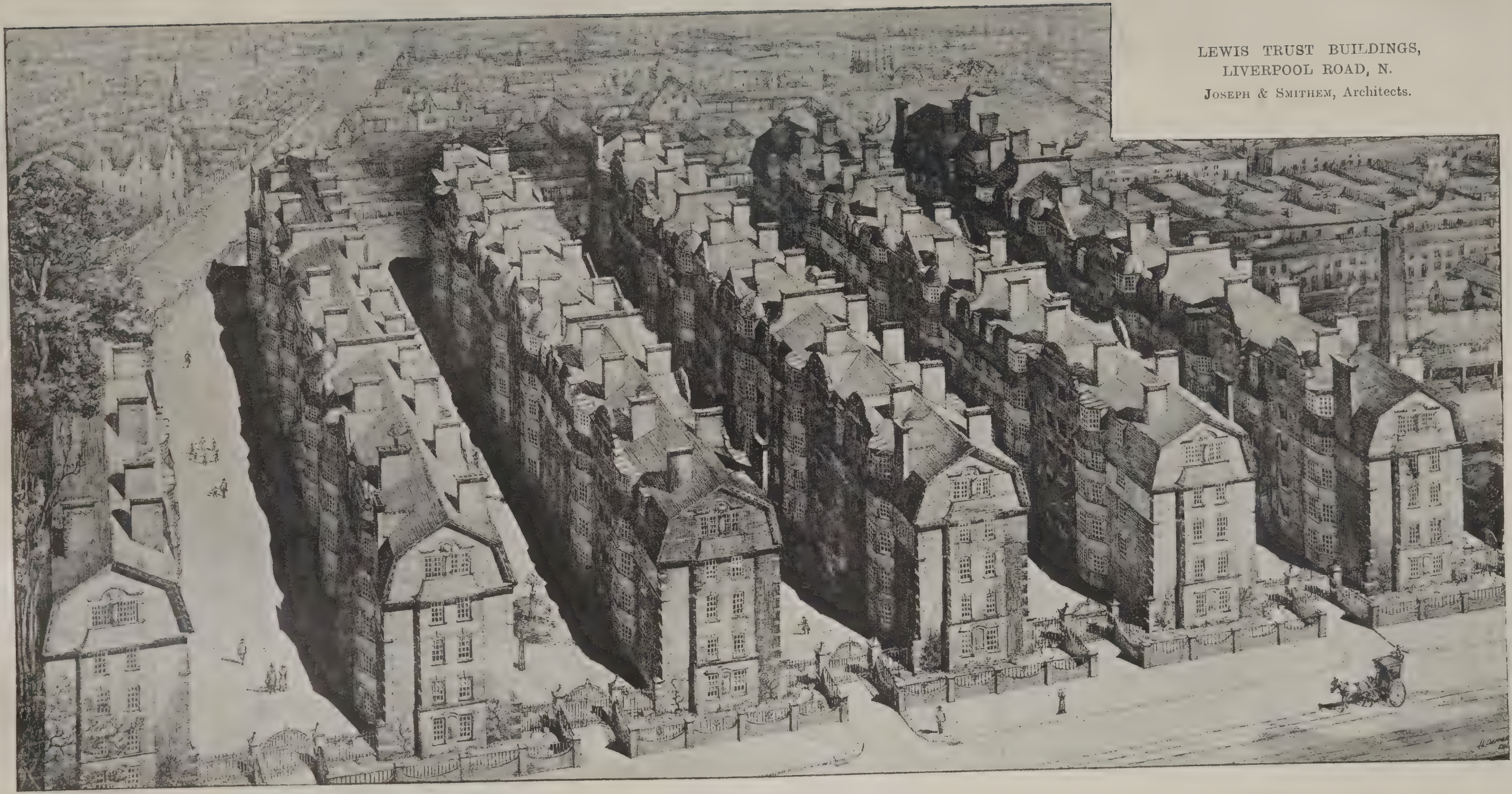
The dorter, or dormitory, ran south from the transept. The frater, or hall, took up the whole of the south side of the cloister, and was raised upon a basement. Beyond the cloister are considerable remains of buildings to the south and east which cannot be identified with certainty.

Ayr Dean of Guild Court have approved plans for alterations at St. Leonard's parish church and the erection of a hall at a cost of 2,100*l*., and for the erection of a church hall and vestry by Wallacetown United Free Church at a cost of 1,000*l*.

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



Drawn by Mr. Charles T. Whiteley.



LEWIS TRUST BUILDINGS,
LIVERPOOL ROAD, N.
Joseph & Smithem, Architects.

## SAMUEL LEWIS DWELLINGS.

These dwellings, which were opened on Wednesday, the 6th inst., have been erected by the trustees upon a site having a frontage of 403 feet to Liverpool Road, N., and a return frontage of 292 feet to Flight's Yard, Islington, containing a superficial area of about 2½ acres. They consist of six parallel blocks and are five storeys in height. The buildings are separated by roadways or playgrounds 40 feet wide, and affording ample lighting and ventilating space to the tenements. The elevations are of an unusually attractive character, the great feature being the introduction of bay windows in artificial stone surmounted by copper domes, and the storeys in the roofs give a pleasant broken sky-line. All the elevations are faced with red Leicester bricks, relieved with dressings of artificial stone of a pale buff tint. The whole of the site has been surrounded by a dwarf glazed brick wall of an ornamental character, surmounted with cast-iron railings. The playgrounds are laid out with flower-beds, and at the end of these playgrounds shelters have been erected to enable the tenants to sit out in comfort protected from the wind. The landings and staircases are tiled from floor to ceiling, and the balustrades to the staircase are constructed of ornamental panel balusters, instead of the usual plain bars. The floors throughout are of fireproof construction, and the landings and pavings are formed of granolithic material.

The buildings will house 1,522 persons, there being rooms divided into 322 tenements as follows:—

Twenty-two one-room tenements, weekly rents from 2*s.* to 2*s.* 6*d.* according to position.

One hundred and fifty two-room tenements, weekly rents from 4*s.* 6*d.* to 6*s.* according to position.

One hundred and fifty three-room tenements, weekly rents from 6*s.* 6*d.* to 8*s.* according to position.

These rents include chimney sweeping and the free use of Venetian blinds and the drying-room. Perambulator and cycle sheds have also been provided for which a weekly charge of 1*d.* will be made. The rents proposed to be charged are considerably under those ruling in the neighbourhood for tenements with rooms of a much smaller area, and not nearly so well fitted up with cupboards and conveniences. The whole of the tenements have been built upon the "self-contained" principle—*i.e.* each with its own scullery and w.c. The single rooms and the living rooms have an average area of 180 feet. The bedrooms of the two-

A Porch

A Feature in the Elevations

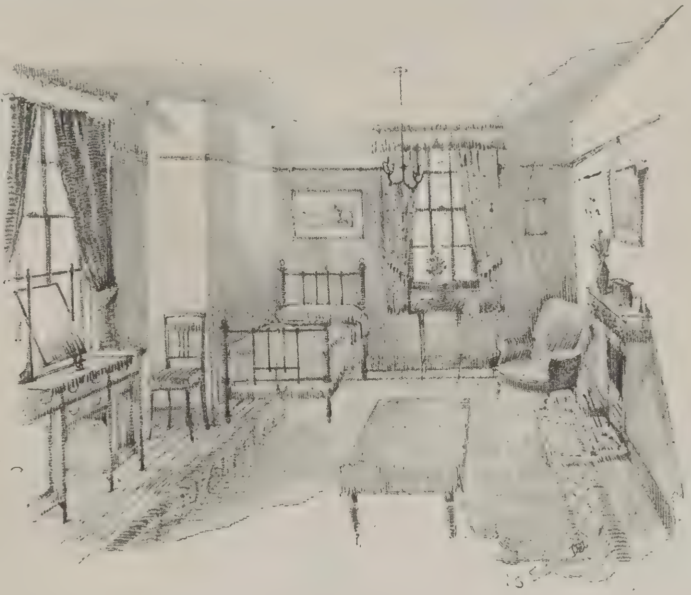
A Shelter and "Pram" Sheds

room tenements have an average area of 130 feet. The two bedrooms of the three-room tenements have an average area of 120 feet and 110 feet respectively. The scullery is not counted as a room.

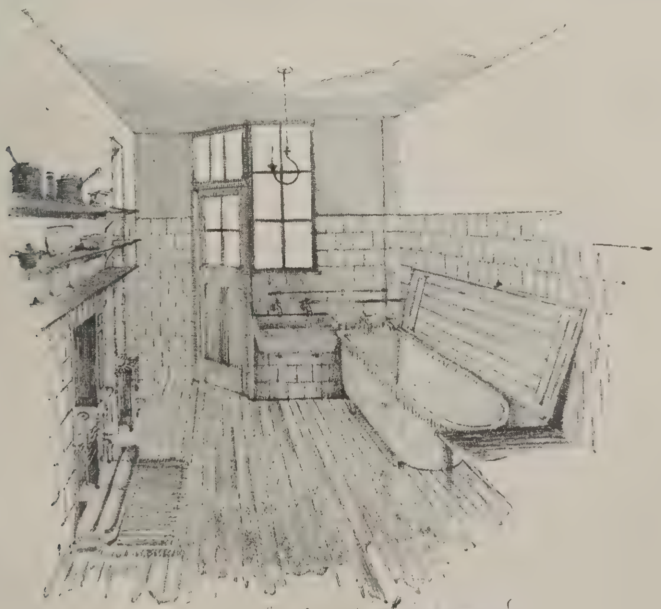
All the tenements are provided with entrance lobbies constructed of fire-resisting material, and in each lobby there is a small recess with hat and coat hooks therein. Every tenement contains a large scullery in which has been fitted a sink and a bath of enamelled cast iron of the strongest description, and also a portable iron copper. In addition there is a gas stove so that the tenants can cook their food throughout the summer months without using the range. The range is of a pattern suggested by H.R.H. the Prince of Wales, and patented by the architects, and has been greatly improved since its introduction. The fire can be transferred from the scullery to the living room after the cooking is done by means of an ingenious arrangement of an iron shutter between the two rooms. By the recent improvement this range in addition now heats the two rooms, cooks the dinner of the tenants, and also provides a constant supply of hot water to the bath and sink. The bath is covered with a table top so that when not in use as a bath forms a convenient table. The whole of the scullery has been tiled with a tile dado. A dresser with three tiers of shelves has also been provided. By this arrangement of the scullery it has been possible to allow the living room to be really a sitting room instead of a kitchen, and is made more pleasing by the addition of a bay which not only allows the sun to enter at all times of the day but also gives additional space. Leading from the scullery is an open balcony from which access to a larder and w.c. is obtained. The w.c. fittings are of automatic pattern and are of the strongest description. The w.c's. are tiled from the floor to ceiling. The larder is divided into two parts, the upper being provided with shelves and ventilated direct to the open air for the storage of food, and the lower part arranged as a coal-bunk.

A "Single" Room" Tenement

Rent Two Shillings per Week



The Bed-Sitting Room



The Kitchen-Scullery

The Balcony

Every bedroom is fitted with a fireplace and a large dress cupboard with hooks for hanging clothes.

Every room is fitted with Venetian blinds, and all the windows have special arrangements for ventilating the rooms when the windows are closed. Above all the tenement doors there are ventilating fanlights so as to secure a through draught from the spacious staircases, all of which are lighted by windows opening directly on to the roadways or playgrounds between the blocks. Every tenement is lighted by gas on the penny-in-the-slot system, and the staircase and playgrounds are also lighted by gas, and by an ingenious arrangement made for the first time in buildings of this character the superintendent is able to light or turn out the whole of the lamps throughout the buildings by means of a switch in his office. A drying room to enable the tenants to have their clothes or washing dried has been provided, where the heat is permanently maintained at a high temperature. A workshop is also provided for the use of the porters, so that any small repairs that are needed can be done on the premises.

The cost of the land and buildings has been approximately 95,000*l.*, and the rents have been adjusted to a scale that will, after providing for all outgoings, give a net return on the expenditure of over 3 per cent. per annum. The dwellings will be occupied by members of the working classes earning a maximum wage of 25*s.* per week. The architects are Messrs. Joseph & Smithem, of 83 Queen Street, Cheapside, E.C., and the builders Messrs. G. E. Wallis & Sons, Ltd., of Maidstone, Kent.

## ALUMINAMEL.

"Aluminamel" is, as its name implies, an enamel having pure aluminium for its base. Among its many invaluable properties is imperviousness to water, soap, soda, petrol, turps, benzoline, paraffin, &c., and also the fact that it will withstand heat up to 500° Fahr. It is applicable to every kind of material, whether it be wood, stone, concrete, glass, or metal, by simple application with an ordinary brush. A deposit of pure aluminium is thus left on the surface, which will withstand any of the above tests. One of its most valuable uses is for renewing metalwork fixed in position, or which for any other reason could not without great inconvenience be placed in a galvanising bath. It is also being extensively employed for covering ventilating fans, motor-car chassis, bridges, piers, railings, down pipes, baths, lampposts, standards, flywheels, heating apparatus, and other situations where the conditions are especially trying. Perhaps the severest of the many tests it has undergone during recent years is its use as a coating for the interior of the evaporators of marine and other engines.

Aluminamel possesses the great superficial capacity of from 1,200 to 1,500 super feet per gallon, according to the material on which it is applied. It is, therefore, apart from its indestructibility, very economical. Unlike much of the aluminium paint or enamel at present sold under English names it is of British manufacture. In addition to the above strictly utilitarian qualities the enamel is valuable for decorative purposes. A single coat is always sufficient to render any surface permanently bright and absolutely waterproof, while by the nature of aluminium it is incorrodible and untarnishable.

The sole proprietors and manufacturers of this desideratum are the British Specialities Co., 349 City Road, E.C., who put it up in airtight tins from pints to gallons—about 11 gallons going to the hundredweight. The tins, it is essential to remember, must be kept well stoppered when not in use, as the product dries and sets hard in five or six minutes. The manufacturers state that they are willing to despatch to any part of Great Britain and Ireland a sample gallon tin at list price, carriage and packing free.

## TRADE NOTES.

It has been decided to carry out the heating of the new County Offices at Dorchester, and Messrs. George A. Akers & Co., heating specialists, of 98 High Holborn, W.C., have been instructed to execute the work. This firm has also received instructions to carry out the heating of the large new printing works at Letchworth, for the builders, Messrs. Openshaw & Co., of Letchworth.

We have been requested to state that the business of the "Zeta" Wood Flooring Co., Ltd., has been purchased outright from the Receiver and Manager, but the change is only proprietary as Mr. William J. Bennett retains the general management of the new company, and will have the same executive staff associated with him as since the foundation of the old company in 1907.

We are advised that Mr. J. J. S. Davidson has resigned the managing directorship of the British Uralite Company, Ltd., of London and Higham, as owing to his other engagements he is unable to give the close personal attention that the interests of the company demand. Mr. Davidson is not severing his connection with the company entirely, as he will continue to act as a director. Under his management the company has been put on a sound financial basis; the factory has been reorganised, new markets have been developed for Uralite at payable prices, and the manufacture of Asbestone has been initiated to compete with Continental materials. Mr. Davidson has prepared a scheme for a new power system, and it is anticipated that when this is carried into effect the company may confidently look forward to a period of continued prosperity.

Mr. Edward Clements, aged 82, of 19a, Victoria Square, W.C., and of 51 Russell Street, W.C., of the firm of Messrs. Clements, Jeakes & Co., sanitary and domestic engineers, left property to the value of 30,437*l.*

## VARIETIES.

St. Mary's parish church, Peckham, London, S.E., is reported to be in such a state that rebuilding at an estimated cost of 2,350*l.* is absolutely required.

It is proposed to construct a new street connecting Orange Street and Trafalgar Square, and also to widen Orange Street and St. Martin's Street. The estimated cost is 2,200*l.*

Messrs. W. Mortimer & Son, architects, Lincoln, have prepared an amended plan for a new children's home to be erected by the Lincoln Board of Guardians at a cost of 1,200*l.*

Mr. Alex. R. Stenning, F.R.I.B.A., President of the Surveyors' Institution, gave a successful "At Home" at the Institution premises, 12 Great George Street, on the evening of Wednesday, April 6, which was attended by upwards of 350 members.

The King's Norton District Council have agreed, subject to the sanction of the Local Government Board, to purchase for 1,057*l.*, for the purpose of constructing baths at King's Heath, a piece of land adjoining the King's Heath and Moseley Institute, containing 4,250 square yards.

Mr. W. W. Lackie, engineer to the Glasgow Corporation Electricity Department, reports that the Committee should consider the question of erecting a new generating station. A site is suggested on the west side of Dalmarnock Road, with a frontage to the Clyde, and a branch of the Caledonian Railway running along its western boundary. The Committee approve generally of the report, but have decided to make further investigations in regard to the suitability of the site. The cost of the site will be about 20,000*l.*

The electric lighting committee of the Edinburgh Town Council recommend the erection of cooling towers at Dewar Place station. It is calculated that the immediate saving in coal will be 3,500*l.*, which may eventually be increased, as the undertaking develops, to three times that sum.

The Stafford Town Council have postponed decision on a proposed scheme for the construction of an entirely new street, 50 feet wide, from Victoria Square to Market Square, at a cost of 20,120*l.*, the principal items being 14,550*l.* for the purchase of the various freehold properties, and 3,550*l.* for the construction of the street.

The strike of painters in Colne has been submitted to arbitration. The men had demanded an advance of a penny an hour, and the employers took a vote as to whether they should offer the men a halfpenny, and found themselves equally divided. It was then agreed that the Board of Trade should be asked to arbitrate, and that the men should at once return to work on the old terms until the Board of Trade gives its award.

The memorial stone of a day school for the parish of Christ Church, Lichfield, was laid on Saturday. The site is near the old condemned school. The new school is being erected from plans by Mr. F. T. Beck, architect, of Wolverhampton, and will contain five classrooms, accommodating 192 elder children and sixty infants. The amount of the contract is 2,190*l.*, and is being carried out by Messrs. Thorneloe & Son, Lichfield. Two other Church schools in Lichfield—Frog Lane Boys' National and Wade Street Infants, both in St. Mary's parish—have also been condemned by the Board of Education.

Messrs. Cackett, Dick & Burns, architects, Newcastle-on-Tyne, have prepared plans converting the corn market at Hexham into an entertainment hall to contain an audience of 800 people, with a full-sized stage and all the usual adjuncts, and providing a kitchen, supper room, suite of cloak rooms, and lavatories for the purpose of the town hall, and making other alterations and improvements. They estimate the cost of converting the corn market into an entertainment hall at about 2,850*l.*, and the additions to the assembly rooms, including pitch pine floor, at 850*l.* The scheme is under consideration.

According to "Industrial Canada" for March, the erection is to be begun this year of a technical school at Toronto which is expected to cost more than 500,000 dollars (about 103,000*l.*). A naval college is to be built at Halifax at a cost of 150,000 dollars (about 30,800*l.*), with barracks for staff, &c. costing an additional 200,000 dollars (about 41,000*l.*). A new wing is to be added to the Quebec Provincial Legislative Buildings at a cost of 250,000 dollars (about 51,400*l.*). The sum of 150,000 dollars (about 30,800*l.*) is to be spent on extending the Place Viger Hotel at Montreal by the addition of 100 rooms. The Yorkshire Insurance Company intend to erect a ten-storey office building at Montreal at a cost of 200,000 dollars (about (41,000*l.*); the architects of the building are Messrs. Saxe & Archibald.

# THE
# Architect and Contract Reporter.

FRIDAY, APRIL 22, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

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**Under no circumstances whatever can the Proprietors of this journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2* p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Edinburgh.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

Pontefract.—April 29.—The Education Authority invite competitive designs for an elementary school from architects practising in Yorkshire. Deposit 1*l*. 1*s*. Mr. W. Haddock, town clerk.

Richmond.—May 21.—The Town Advancement Association offer prizes of twenty guineas and five guineas for a double-royal poster exploiting the attractions of the town. The Offices of the Association, 1 The Little Green, Richmond, Surrey.

Stockport.—May 2.—Architects desirous of competing for the designs of the library which the Corporation propose to erect are invited to send their names, with information as to their experience in and qualifications for carrying out such work, to Mr. Robert Hyde, town clerk, Town Hall, Stockport.

Walsall.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.

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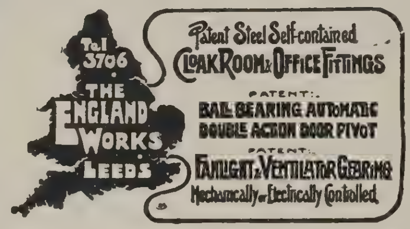
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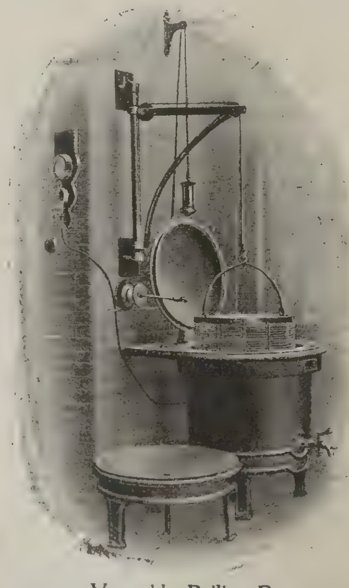
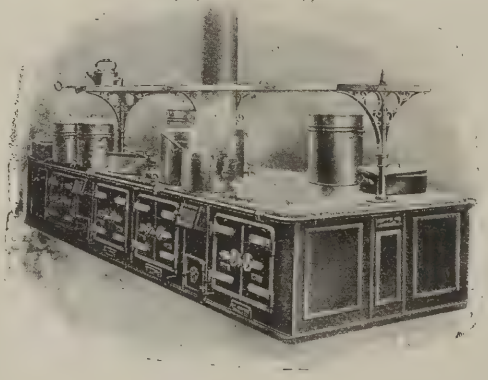


Vegetable Boiling Pan.



Central Range.

Carving Table with Bain Marie and Overhead Gear.

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**Steam, Coal, Gas.**

ALL LATEST IMPROVEMENTS AND DESIGNS.

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## CONTRACTS OPEN.

**Allerthorpe.**—For the bricklayers, joiners, tilers, plumbers, plasterers, and painters' work required in erection of a small residence at Allerthorpe, near Pocklington, Yorks. Mr. A. Bracewell, architect, Thwaites, Keighley.

**Barrow-in-Furness.**—April 22.—For alterations to the borough treasurer's department, Town Hall. The Borough Engineer's Office.

**Bedale.**—April 30.—For erection of six dwelling houses. Mr. John Croft, Market Place, Bedale, Yorks.

**Birkenhead.**—April 26.—For erection of a sorting office, Rock Ferry. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

**Birkenhead.**—April 25.—For the construction and completion of an underground convenience and lavatory in the Market Square and Hamilton Street. Deposit 1*l.* Mr. Charles Brownridge, M.I.C.E., borough engineer and surveyor, Town Hall, Birkenhead.

**Blennerhasset.**—April 30.—For the erection of cloakrooms to the Blennerhasset Council School, Cumberland. The Clerk of Works, 13 Earl Street, Carlisle, or Mr. F. Richardson, solicitor, Aspatria.

**Bridgend.**—May 7.—For erection of a board room and offices at the Workhouse. Mr. P. J. Thomas, architect, Bridgend.

**Cambridge.**—May 4.—For erection of two cottages in Albion Row. Borough Surveyor, Guildhall, Cambridge.

**Canterbury.**—April 23.—For the execution of works in connection with the proposed extension of the School of Art. Deposit 5*l.* Messrs. Jennings & Gray, architects, 4 St. Margaret's Street, Canterbury.

**Chelmsford.**—April 26.—For the execution of the following works in the Cattle Market:—(1) Construction of roof over Messrs. Rodd & Slipper's stand; (2) construction of a roof over Messrs. Offin & Rumsey's auction ring; (3) erection of a small horse shed of corrugated iron; (4) fixing new manger in and repairing existing horse shed. The Borough Surveyor's Office, 16 London Road, Chelmsford.

**Cove.**—April 25.—For erection of a Council school for 140 children at Cove, near Farnborough. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

**Crewe.**—April 27.—For erection of a sorting office, Crewe Station. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

**Danbury.**—April 29.—For erection of a small brick water tower and other work incidental thereto at Danbury, near Chelmsford. Mr. James Dewhirst, A.M.I.M.E., Bank Chambers, Chelmsford.

**Dewsbury.**—April 29.—For the various works required in enlargement of the dispensary at the General Infirmary. Messrs. Kirk, Sons & Ridgway, F.R.I.B.A., architects and surveyors, Market Place, Dewsbury.

**Diptford.**—April 28.—For erection of masonry piers and the fixing of an iron bridge and other work over the River Avon, near the Manor House, Diptford, Totnes. Mr. W. F. Tollit, architect, 10 High Street, Totnes, or Mr. C. Ellis, highway surveyor, South Brent.

**Durham.**—April 26.—Sole tenders are invited for house in Durham. City Accountant's Office, 6 Saddler Street, Durham.

**Easingwold.**—For erection of a dwelling-house on the Crayke Road. Barclay's Bank House, Easingwold, Yorks.

**Eastbourne.**—April 25.—For alterations to the entrance lodge at Ocklynge Cemetery. Mr. C. Montague Wood, architect, 79 Whitley Road, Eastbourne.

**East Molesey.**—April 25.—For alterations and additions to manufacturing premises at Creek Road. Deposit 1*l.* 1*s.* Messrs. Fuller, Horsey, Sons & Cassell, architects, 11 Billiter Square, E.C.

**Eastwood (Essex).**—April 25.—For erection of a cow-shed for eight cows adjoining the Council school at Eastwood, Essex. Clerk of the Council, Shire Hall, Chelmsford.

**Egremont.**—April 25.—For the several works required in converting buildings into Masonic Hall, and for building ante-rooms, lavatories, &c. Also for gutting and reconstructing dwelling house, erection of boundary wall, gates, &c. Mr. James Lowery, Secretary to the Trust, 59 Main Street, Egremont, Cumberland.

**Ellesmere Port.**—April 23.—For erection of County police buildings at Ellesmere Port, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Chester.

**Falmouth.**—April 30.—For additions and alterations to the Falmouth Grammar School, the work including heating of the premises by hot water. Mr. Sampson Hill, architect, Green Lane, Redruth.

**Frizington.**—April 26.—For the various works required in erection of a dwelling house, Frizington, Cumberland. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

**Glasgow.**—April 26.—For clearing the site, putting in foundations, &c., in connection with the erection of a labour and telephone exchange in College Street, Glasgow. Mr. Kennedy, clerk of the works, General Post Office, Glasgow (Hanover Street entrance).

**Glasgow.**—May 3.—For the following work in connection with the reconstruction of Glasgow Justiciary Courts, viz.:—(1) Excavator, mason, brick, &c., works; (2) carpenter, joiner, and glazier works; (3) slater work; (4) plumber work; (5) plaster work. Deposit 4*l.* 4*s.* for each of the schedules for mason and joiner works, and 2*l.* 2*s.* for each of the schedules for other works. Messrs. Robert Scott & Son, measurers, 115 Wellington Street.

**Glasgow.**—May 7.—For the construction of a goods shed, 1,640 feet long by 100 feet wide, on Meadowside Quay, Partick. The Clyde Navigation Trustees' engineer, 16 Robertson Street, Glasgow.

**Goodmayes.**—April 30.—For carrying out alterations and additions, Little Heath House, Goodmayes Asylum, Essex. Deposit 1*l.* Mr. John G. Morley, borough engineer, Town Hall, West Ham.

**Grange-over-Sands, &c.**—May 5.—Tenders (whole or separate trades) are invited for erection of three houses in Fernleigh Road; also for fourteen houses off Fernleigh Road; also for forming front street and two back streets and sewers; and for erection of a bungalow in Kentsford Road, Kents Bank. Messrs. Settle & Brundit, A.R.I.B.A., architects, Ulverston and Barrow-in-Furness.

**Halifax.**—April 25.—For the various works required in alterations and additions to the Halifax Golf Club. Messrs. Utley, Hebblethwaite & Utley, architects, 10 Waterhouse Street, Halifax.

**Halifax.**—April 27.—For extensive excavations in connection with the erection of an arcade and billiard hall on the Wards End Estate. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

**Handsworth.**—May 2.—For erecting a mess room, cottage, &c., at the cemetery, Camp Lane. Deposit 1*l.* 1*s.* Mr. H. Richardson, A.M.Inst.C.E., Council House, Handsworth, Staffordshire.

**Hartlebury.**—May 7.—For provision of all materials for, and erection of, new schools at Hartlebury, near Kidderminster. Deposit 2*l.* 2*s.* Mr. S. S. Reay, F.R.I.B.A., 4 Unity Street, College Green, Bristol.

**Heanor.**—May 9.—For erection of proposed secondary school, Heanor, to accommodate 250 students. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

**Heckmondwike.**—For the bricklayer and mason's work, carpenter and joiner's, plumber and glazier's, and plasterer's work required in proposed alterations and additions to the headquarters of the 2nd West Riding Brigade R.F.A., Artillery Street. Mr. Albert E. Kirk, A.R.I.B.A., architect, 63 Albion Street, Leeds.

**Hull.**—April 27.—For erection of a house, stables, granary, cart and wagon sheds, and for the construction of a road, &c., in the parish of Broomfleet. The Engineer to the Board (Mr. A. E. Butterfield), Humber Conservancy Offices, Whitefriargate, Hull.

**Ireland.**—April 25.—For station master's house at Keady, and two cottages at Goraghwood, for the Great Northern Railway Co. (Ireland). Mr. F. A. Campion, chief engineer, Amiens Street Terminus, Dublin, or the District Engineer, Belfast.

**Ireland.**—For building and completing a rectory at Ballyhalbert, co. Down. Mr. Henry Seaver, architect, 16 Donegall Square South, Belfast.

**Ireland.**—May 9.—For the erection of a doctor's residence and dispensary for Newcastle Dispensary District at Killadreenan, near Newtownmountkennedy. Mr. G. T. Moore, C.E., &c., 1 and 2 Foster Place, College Green, Dublin.

**Ireland.**—May 7.—For building and fencing twelve single labourers' cottages, for the Milford Rural District Council; cost of building and fencing each cottage not to exceed 117*l.* Mr. S. Watters, clerk, Milford, co. Donegal.

Ilford.—April 26.—For the erection of a block of offices at the Electricity Works, Ley Street. Deposit 2*l.* 2*s.* Mr. H. Shaw, M.I.C.E., engineer and surveyor, Town Hall, Ilford.

Keighley.—April 25.—For work required in erection of a foundry and machine works at Strong Close. Messrs. Moore & Crabtree, architects, York Chambers, Keighley.

Kendal.—April 22.—For erection of two semi-detached cottages, Colin Field Lane. Mr. John F. Curwen, F.R.I.B.A., F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Kendal.—April 28.—For the various works required in connection with alterations and repairs to Meal Bank school. Mr. Malcolm G. Shaw, architect, 45 Highgate, Kendal.

London.—April 27.—For the construction of a subway beneath Orange Street, Westminster, S.W. Deposit 1*l.* 1*s.* Mr. H. N. Hawks, I.S.O., at H.M. Office of Works, &c., Storey's Gate, S.W.

London.—May 2.—For erection of stables in Scotland Yard. Deposit 1*l.* 1*s.* Sir Henry Tanner, I.S.O., at H.M. Office of Works, Storey's Gate, S.W.

Louth.—April 25.—For the rebuilding of the Golden Lion Inn at Fishtoft and the Crown Inn at Saltfleet. Mr. R. H. Fowler, architect, Louth, Lincs.

Luton.—May 2.—For erection of school buildings to accommodate 350 children on Beech Hill, Dunstable Road. Deposit 1*l.* 1*s.* The Secretary to the Committee, Town Hall, Luton.

Manchester.—May 4.—For alterations to the boiler house at the Swinton schools. Deposit 10*s.* 6*d.* Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

Norland.—April 27.—For the works necessary in pulling down and rebuilding the house, &c., at Butterworth End Farm, Norland, Yorks. Send names by April 27 to Messrs. Richard Horsfall & Son, architects, 22a Commercial Street, Halifax.

Orrell.—April 25.—For the whole or any separate trade required in the erection of a Primitive Methodist Sunday-school at Orrell, near Wigan. Forward name and address and trade by April 25 to Mr. W. G. Smithson, A.R.I.B.A., architect, 13 Bond Street, Leeds.

Poole.—April 26.—For the extension of the scullery at the workhouse. Mr. E. Van Schepdael, architect, Wimborne Road, Poole.

Scotland.—April 25.—For excavating and building in brickwork, at Inverkeithing, a gas holder tank, a tar tank, a retort house, a governor house, and sundry small foundations. Deposit 10*s.* 6*d.* The Inverkeithing Gas Light Co., Ltd., 16 High Street, Inverkeithing, or Mr. H. O'Connor, A.M.I.C.E., 1 Drummond Place, Edinburgh.

Scotland.—April 28.—For the several works required in the erection of branch business premises and dwelling houses at Low Torry, Torryburn, for the Dunfermline Co-operative Society, Ltd. Messrs. Andrew Scobie & Son, architects, Dunfermline.

Salford.—May 2.—For the construction of a covered way to connect the municipal secondary school for girls and the education office. The Director of Education, Education Office, Chapel Street, Salford.

Seaforth.—April 25.—For erection of a secondary and technical school in Cambridge Road, Seaforth, Liverpool. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Southport.—May 5.—For alterations and additions required at the Water Board Offices, Portland Street. Deposit 1*l.* 1*s.* Mr. Alleyne Brown, clerk, 11 St. George's Place, Lord Street, Southport.

Veryan.—April 23.—For erection of a cottage at Boswague Farm, Veryan, Cornwall. Mr. A. Ernest Harris, architect, 28 Boscawen Street, Truro.

Wales.—April 28.—For erection of additional wards at the Workhouse Infirmary, Merthyr Tydfil. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—April 26.—For erection of sixteen or more cottages at Abercynon, Pontypridd, for Messrs. The Goitre-Coed Fawr Building Club. Mr. William Dowdeswell, architect, Treharris.

Wales.—May 4.—For the following works, for the committee of visitors of the Glamorgan County Asylum:—(1) Alterations and additions to slaughter-house at Angleton Asylum; (2) alterations to and re-slating cowhouse at Parc Gwyllt Asylum; (3) alterations to stables for isolation boxes at Parc Gwyllt Asylum; (4) conversion of cart shed into stables and fodder store. Mr. W. E. R. Allen, clerk to the committee of visitors, Glamorgan County Council Offices, Westgate Street, Cardiff, or Mr. P. J. Thomas, architect, Bridgend.

Wales.—April 25.—For erection of a warehouse in Paradise Place, Cardiff. Deposit 2*l.* 2*s.* Mr. F. C. Stibbs, architect, 33 Queen Street, Cardiff.

Wales.—For erection of George Edwards Hall, Cefn, Ruabon. Mr. W. Ryland Jones, clerk to Parish Council, High Street, Cefn, Ruabon.

Wales.—April 30.—For alterations and extensions to the Star Inn, Crynant. Mr. J. Cook Rees, architect, Neath.

Wales.—April 30.—For erection of a boundary wall round St. Barnabas Church, Gilfach Goch. The Rev. G. M. Llewellyn, Gilfach Goch.

Wales.—April 22.—For the erection of a public abattoir, stabling and other works, at Pontypool. Deposit 2*l.* 2*s.* Mr. D. J. Lougher, architect and surveyor, Bank Chambers, Pontypool.

Wales.—April 23.—For alterations and additions to existing farmhouse, buildings and outbuildings, Mill Farm, Monknash, Glamorgan. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—April 25.—For erection of 14 semi-detached houses at Bedwas, for the Tydfil Road Building Club. Mr. Ralph Simmonds, architect and surveyor, Blackwood.

Wales.—April 25.—For erection of 16 houses, including sewers and lanes, at Senghenydd. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects, Church Street Chambers, Pontypridd.

Wales.—May 2.—For alterations and additions to Trallwn bakery, Trallwn, Pontypridd. Deposit 2*l.* 2*s.* Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

Wales.—April 29.—For erection of two houses in Bryn Road, Tondu. Mr. O. P. Bevan, architect and surveyor, "Express" Chambers, Merthyr Tydfil.

Wales.—April 27.—For erection of thirty-four houses at Coed Ely, Tonyrefail, for the No. 2 Coed Ely Building Club. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects, Church Street Chambers, Pontypridd.

Wales.—May 2.—For alteration and extension of premises at Ystrad, Rhondda, for the Pentre Conservative Club. Mr. J. Rees, architect, Pentre.

Wanstead.—May 4.—For the erection of a foreman's cottage at the Wanstead Sewage Farm, Empress Avenue, Manor Park. Deposit 1*l.* Mr. C. H. Bressey, surveyor, Council Offices, Wanstead, N.E.

Whitby.—April 29.—For erection of a new drill hall and for carrying out sundry alterations to the Union Mill for converting it into headquarters for the local Territorial Force. Mr. Edward H. Smales, A.R.I.B.A., architect, 64 Baxtergate, Whitby.

Whitchurch.—April 25.—For work to be done at the Isolation Hospital and caretaker's cottage, at Larksborough, Whitchurch, Hants. Mr. J. S. Knight, assistant superintendent, 6 Station Road, Whitchurch, Hants.

Wigan.—April 27.—For the erection of the People's Palace and Opera House. Messrs. Heaton, Ralph & Heaton, architects, King Street, Wigan, Lancashire.

Winterbourne.—April 30.—For alterations and additions to farmhouse, buildings and cottages, at Winterbourne Zelstone Farm, Dorset, to adapt them for small holdings, &c. Mr. E. Archdall Ffooks, County Council Office, Sherborne.

Woolwich.—April 27.—For additions, alterations and repairs to a mission hall in Francis Street, North Woolwich, to adapt it as a branch public library. Deposit 1*l.* 1*s.* Mr. J. Rush Dixon, M.I.C.E., borough engineer, Town Hall, Woolwich.

Yorks.—May 6.—The West Riding education committee invite whole or separate tenders for the following works, viz.:—Hensall Council school: alterations and additions; Denby and Cumberworth Birdsedge proposed Council school: builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Deposit 1*l.* in each case must be sent to the West Riding Treasurer, County Hall, Wakefield.

The Paisley Town Council last week accepted the plans submitted by Sir William Arrol & Co. for the new bridge to be erected at Carlile Quay. The estimated cost is 2,240*l.* The bridge will connect the northern districts of the town separated by the river Cart.

The Corporation of Southend-on-Sea have made a profit of 11,000*l.* from the Corporation electric light and tramways undertaking, with the result that the general district rate will be reduced to 3*s.* 3*d.* in the pound. The Western Esplanade is to be widened at a cost of 52,000*l.*

# TENDERS.

## BERE ALSTON.

For new elementary school for 124 boys, for Devon County Education Authority. Mr. P. Morris, county architect (education), Exeter.

| | | | |
|---|---|---|---|
| Pearn Bros. | £2,184 | 0 | 0 |
| Stanbury | 1,560 | 16 | 6 |
| Andrews | 1,560 | 0 | 0 |
| Lapthorn & Co. | 1,540 | 0 | 0 |
| Bryer, jun. | 1,533 | 13 | 2 |
| Yeo & Sons | 1,428 | 1 | 9 |
| Wakeham Bros. | 1,405 | 12 | 0 |
| James | 1,372 | 1 | 6 |
| Richards | 1,362 | 11 | 2 |
| Paynter | 1,312 | 5 | 2 |
| Bennett, Bodmin (*accepted*) | 1,312 | 1 | 7 |
| Architect's estimate | 1,550 | 0 | 0 |

## BERKHAMSTED.

For erecting a residence. Messrs. Moscrop-Young & Glanfield, architects, 20 Brook Street, Bond Street, W.

| | | | |
|---|---|---|---|
| Collwell & Edgar | £1,325 | 0 | 0 |
| H. & J. Matthews | 1,299 | 0 | 0 |
| Smith & Son | 1,296 | 0 | 0 |
| Miskin & Sons | 1,295 | 0 | 0 |
| Tutt & Son | 1,287 | 0 | 0 |
| Honour & Son | 1,236 | 0 | 0 |
| Brightman & Son (*accepted*) | 1,147 | 0 | 0 |

## DERBY.

For erection of additional wards to the Nightingale Nursing Home. Messrs. Thorpe & Fryer, architects, 23 St. James's Street, Derby.

| | | | |
|---|---|---|---|
| Fryer | £4,847 | 10 | 0 |
| Kershaw & Son | 4,800 | 0 | 0 |
| Walker | 4,487 | 0 | 0 |
| J. & J. Warner | 4,300 | 0 | 0 |
| Pegg & Bailey | 4,298 | 0 | 0 |
| Smith | 4,291 | 0 | 0 |
| Walkerdine | 4,260 | 0 | 0 |
| Radford & Greaves | 4,250 | 0 | 0 |
| Dickinson | 4,188 | 0 | 0 |
| Morley & Son | 4,165 | 0 | 0 |
| Walker & Slater | 4,095 | 0 | 0 |
| Ford & Sons, Derby (*accepted*) | 4,067 | 10 | 0 |

## DEWSBURY MOOR.

For extension of shed, new stone house, &c., at West Field Mills. Messrs. Holtom & Fox, architects, Dewsbury.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Whitehead, Ravensthorpe, mason | £257 | 12 | 0 |
| Richardson, Staincliffe, joiner | 77 | 18 | 0 |
| Thompson, Dewsbury, slater | 38 | 10 | 0 |
| Newsome, Dewsbury, plumber | 14 | 17 | 0 |
| Firth, Dewsbury, ironfounder | 11 | 10 | 0 |
| Parker & Sons, Heckmondwike, plasterer | 4 | 3 | 8 |

## LEICESTER.

For erection of a factory and warehouse, Sanvey Gate. Messrs. Topott & Son, architects, Leicester.

| | | | |
|---|---|---|---|
| Sleath | £5,219 | 0 | 0 |
| Herbert & Sons | 5,170 | 0 | 0 |
| Sharp | 4,977 | 0 | 0 |
| Duxbury & Co. | 4,940 | 0 | 0 |
| Chapman | 4,899 | 0 | 0 |
| Bowles & Son | 4,897 | 0 | 0 |
| Booth | 4,865 | 0 | 0 |
| Mason & Sons | 4,840 | 0 | 0 |
| Cole & Sons | 4,822 | 0 | 0 |
| Fox | 4,809 | 0 | 0 |
| Potter | 4,804 | 19 | 0 |
| Bradshaw Bros. | 4,779 | 11 | 6 |
| Hanson | 4,744 | 0 | 0 |
| Bradford | 4,739 | 0 | 0 |
| Haddon | 4,707 | 8 | 0 |
| Clark & Garrett | 4,686 | 0 | 0 |
| Cox & Co. | 4,684 | 5 | 3 |
| Marston & Son, Leicester (*accepted*) | 4,682 | 0 | 0 |

## LONDON.

For alterations to the Manchester Square Fire Station, for the London County Council.

| | | | |
|---|---|---|---|
| Johnson & Co. | £1,470 | 0 | 0 |
| F. & H. F. Higgs | 1,448 | 0 | 0 |
| Munday & Sons | 1,379 | 0 | 0 |
| Higgs & Hill | 1,284 | 0 | 0 |
| J. & C. Bowyer, Upper Norwood (*accepted*) | 1,197 | 0 | 0 |
| Architect's approximate estimate | 1,470 | 0 | 0 |

## LONDON—*continued.*

For paving of yard at Charlton Fire Station with ironstone tiles, for the London County Council.

| | | | |
|---|---|---|---|
| Mitchell & Son | £225 | 0 | 0 |
| Johnson & Co. | 224 | 0 | 0 |
| Higgs & Hill | 220 | 0 | 0 |
| J. & C. Bowyer | 218 | 0 | 0 |
| Holloway | 202 | 0 | 0 |
| F. & T. Thorne, Isle of Dogs (*recommended*) | 193 | 0 | 0 |
| Architect's approximate estimate | 250 | 0 | 0 |

For the widening and reconstruction of the bridge carrying the railway over Brockley Road, for the London County Council.

| | | | |
|---|---|---|---|
| Fasey & Son | £7,205 | 9 | 1 |
| Thorne & Sons | 6,394 | 7 | 6 |
| Pattison & Sons | 6,180 | 5 | 7 |
| Rigby | 6,165 | 1 | 0 |
| Kirk & Randall | 5,980 | 0 | 0 |
| Mowlem & Co. | 5,973 | 0 | 0 |
| Aird & Sons, Lambeth (*accepted*) | 5,693 | 3 | 7 |

For supply of a hot-water circulating plant at Cane Hill Asylum, for the London County Council.

| | | | |
|---|---|---|---|
| Dargue, Griffiths & Co. | £2,929 | 2 | 0 |
| Newton, Chambers & Co. | 2,820 | 0 | 0 |
| Strode & Co. | 2,493 | 0 | 0 |
| Brightside Foundry and Engineering Co., Sheffield (*accepted*) | 2,417 | 0 | 0 |
| Haden & Sons | 2,410 | 0 | 0 |

For repairs to the interior of the town hall, for the Deptford Borough Council.

| | | | |
|---|---|---|---|
| Holloway | £218 | 0 | 0 |
| Bickerton | 205 | 0 | 0 |
| J. & A. Oldman | 195 | 10 | 0 |
| Oldman & Sons | 190 | 0 | 0 |
| Best | 167 | 1 | 6 |
| Hall Bros. | 149 | 0 | 0 |
| Falkner | 145 | 0 | 0 |
| Thresher, St. John's Terrace (*accepted*) | 135 | 10 | 0 |

## LONG EATON.

For widening of existing bridge over the Erewash Canal, Derby Road. Mr. F. Worrall, A.M.Inst.C.E., engineer and surveyor, Long Eaton.

| | | | |
|---|---|---|---|
| Baker & Sons | £3,928 | 9 | 8 |
| Thorne & Sons | 2,098 | 18 | 2 |
| Muirhead & Co. | 1,670 | 13 | 6 |
| Hyslop | 1,447 | 12 | 7 |
| Ashley | 1,365 | 4 | 5 |
| Johnson & Longley | 1,312 | 19 | 1 |
| Price & Co. | 1,300 | 1 | 11 |
| Tomlinson, Derby (*accepted*) | 1,296 | 0 | 8 |

For bridge over Erewash Canal, Lawley Road. Mr. F. Worrall, A.M.Inst.C.E., engineer and surveyor, Long Eaton.

| | | | |
|---|---|---|---|
| Baker & Sons | £8,322 | 7 | 4 |
| Thorne & Sons | 5,360 | 3 | 2 |
| Muirhead & Co. | 4,471 | 1 | 2 |
| Price & Co. | 4,214 | 0 | 4 |
| Hyslop | 3,962 | 12 | 6 |
| Tomlinson | 3,835 | 3 | 7 |
| Ashley | 3,767 | 18 | 8 |
| Johnson & Longley, Leicester (*accepted*) | 3,629 | 5 | 10 |

## MILTON.

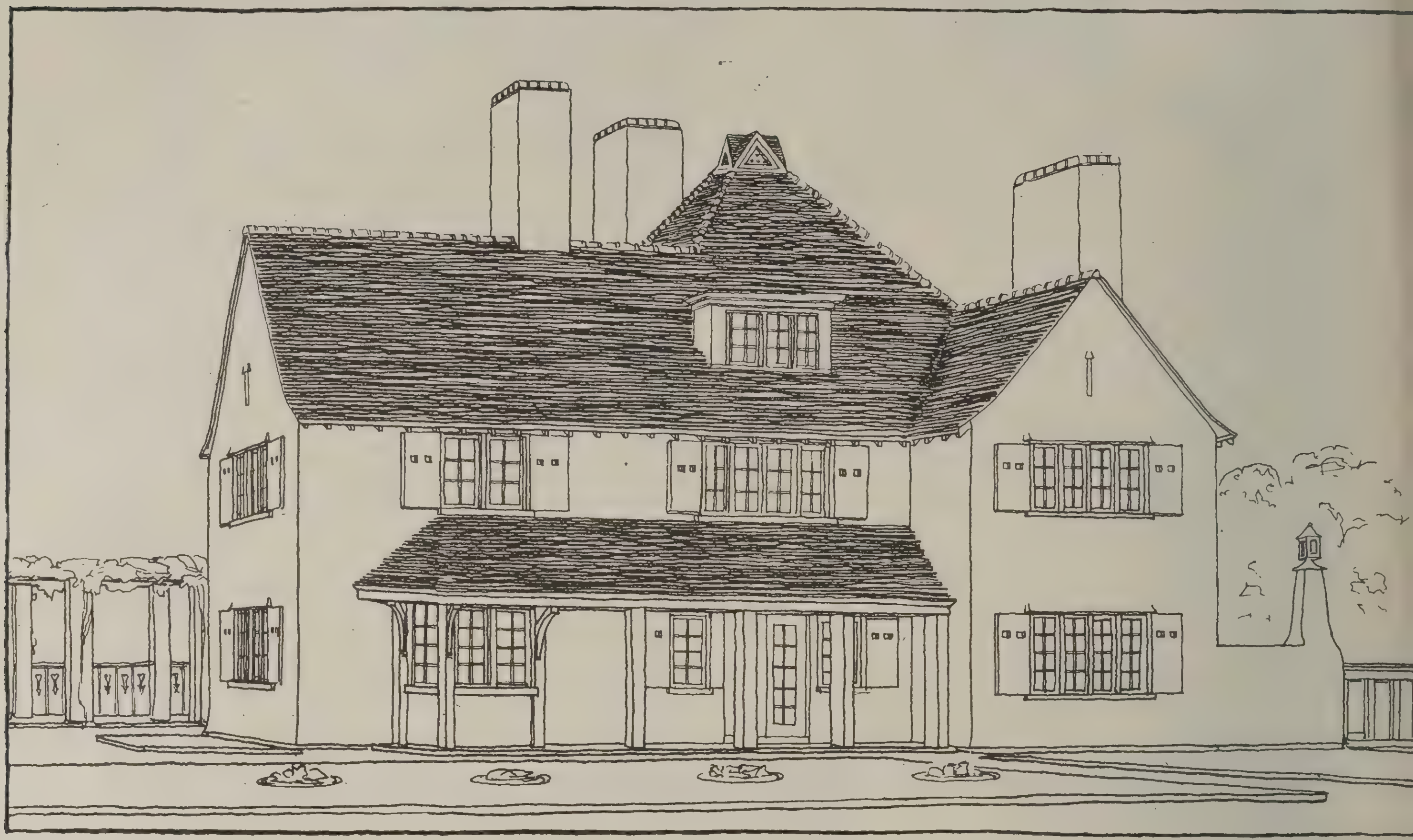
For erection of two cottages at the Waterworks, Milton, Derbyshire, for the Swadlincote and Ashby Joint Water Committee. Mr. A. J. Mason, engineer, Swadlincote.

| | | | |
|---|---|---|---|
| Wood | £680 | 0 | 0 |
| Clarke | 655 | 0 | 0 |
| Warner | 635 | 0 | 0 |
| Kershaw & Sons | 585 | 0 | 0 |
| Whitaker, Burton-on-Trent (*accepted*) | 545 | 0 | 0 |

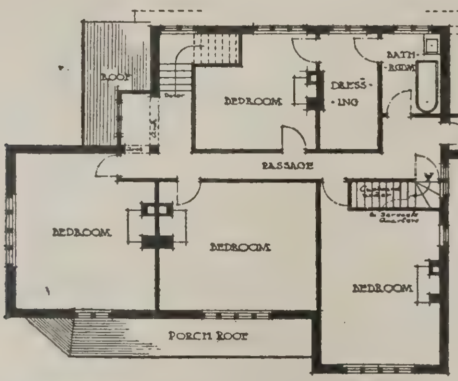
## RAMSGATE.

For erection of the Lilian Road infants' school. Mr. W. T. Stocks, architect, Ramsgate.

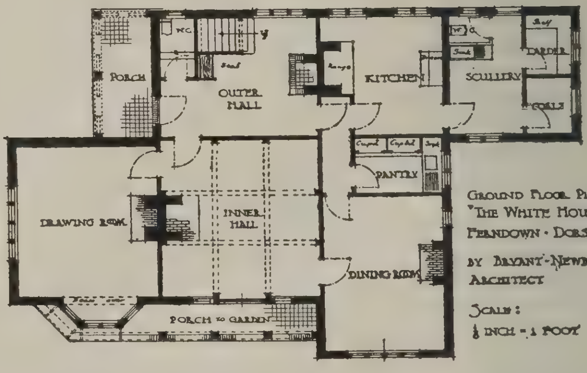
| | | | |
|---|---|---|---|
| Attwood | £6,070 | 9 | 6 |
| May | 6,000 | 0 | 0 |
| Seager | 5,899 | 0 | 0 |
| Grummant Bros. | 5,839 | 0 | 0 |
| Stephens & Bastow | 5,697 | 0 | 0 |
| Browning | 5,696 | 0 | 0 |
| Woodhall & Son | 5,648 | 0 | 0 |
| T. T. Denne | 5,639 | 0 | 0 |
| Amos & Foad | 5,525 | 0 | 0 |
| G. T. Denne | 5,460 | 0 | 0 |
| Ballard, Ramsgate (*accepted*) | 5,431 | 0 | 0 |



· House in Ferndown · · Dorset ·
· by Bryant-Newbold · Architect ·



First Floor Plan
"The White House"
Ferndown · Dorset
by Bryant-Newbold
Architect
Scale:
1/8 Inch = 1 Foot



Ground Floor Plan
"The White House"
Ferndown · Dorset
by Bryant-Newbold
Architect
Scale:
1/8 Inch = 1 Foot

## LIVERPOOL ARCHITECTURAL SOCIETY.

The annual meeting of the Liverpool Architectural Society was held on the 18th inst., at 13 Harrington Street, Mr. T. E. Eccles, F.R.I.B.A., the president, occupying the chair.

The Council reported that the present membership of the society consisted of fifty-one fellows and seventy-three associates, compared with fifty-four fellows and seventy-seven associates at the close of last session. There are three hon. fellows, nine hon. associates, and twenty-three students—a decrease of five students during the year. The Royal Institute of British Architects having appointed a special committee to consider the question of the responsibility of architects with regard to dry rot, submitted the conclusions of the committee for the consideration of the Council of the Liverpool Society. The Council replied, strongly disapproving of the proposals of the Institute. The features to which the Council objected have been omitted in the R.I.B.A. pamphlet recently issued. The munificence of Mr. W. H. Lever to the University of Liverpool, by which the School of Civic Design is placed upon a permanent basis, and the old Blue Coat School buildings, now to be called Liberty Buildings, are preserved as the home of the School of Architecture, is, the report concludes, an act of liberality which calls for the appreciation of all interested in the art and profession of architecture.

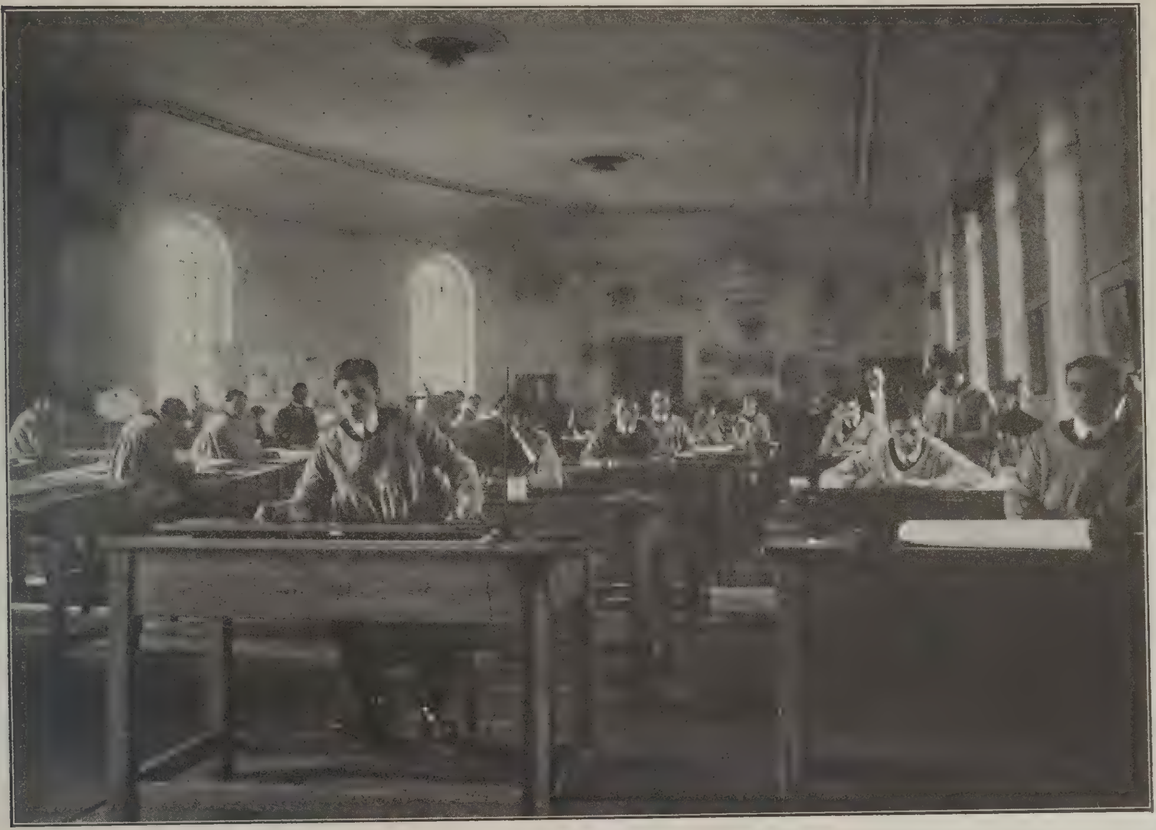
The report and accounts were adopted.

The following officers and members of the Council were elected for the ensuing year:—President, Mr. Arnold Thornely; vice-presidents, Mr. E. P. Hinde and Professor C. H. Reilly, M.A.; hon. secretaries, Mr. Gilbert W. Fraser and Mr. E. C. Aldridge; members of the Council, Professor Adshead and Messrs. W. Glen Dobie, J. Dod, T. E. Eccles, G. H. Grayson, M.A., P. C. Thicknesse, W. E. Willink, L. P. Abercrombie and T. F. Shepheard.

The retiring president made sympathetic reference to the death of Mr. Wm. Owen, of Warrington, an old and esteemed member of the society, and the loss which the society had suffered by the death of Messrs. T. Mellard Reade, A. F. M'Gregor Milligan and R. Lloyd Williams.

## SCHOOL OF ARCHITECTURE, LIVERPOOL.

By Professor C. H. Reilly.



MAIN STUDIO, FORMERLY CHAPEL OF OLD BLUE COAT SCHOOL.

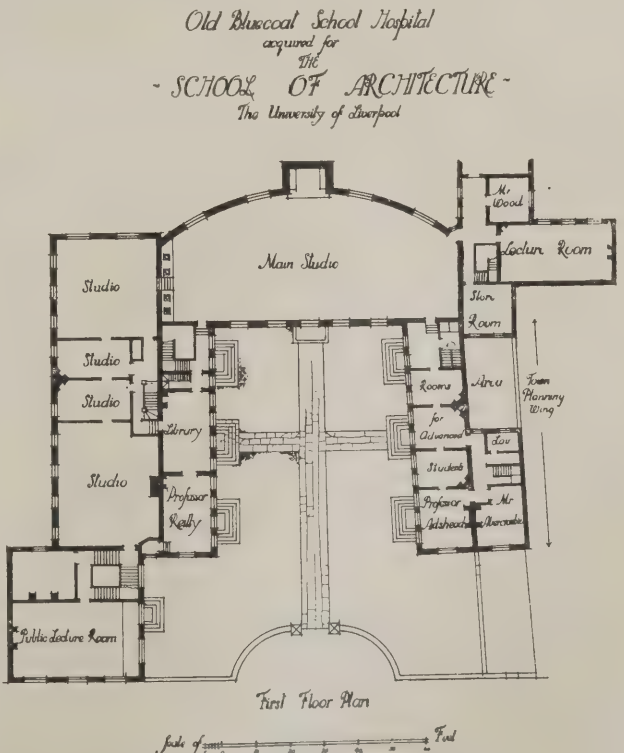
The old Blue Coat School of Liverpool, which through the generosity of Mr. Lever has now become the home of the School of Architecture, was built in the years 1716-7, and is a good and complete example of Queen Anne architecture—indeed, the only one Liverpool possesses. It is situated in a quiet side street called School Lane, but faces the main thoroughfare of Liverpool, Church Street, across the grass of the pro-cathedral churchyard.

The architectural interest centres in the buildings surrounding the court, which were the first to be built and have remained unaltered to this day. These the school now occupies. The main block facing the gateway consists of the dining-room and chapel over it, now the exhibition room and main studio of the school, two large rooms 90 feet by 40 feet, well lit with large windows on either side. The two wings were designed to accommodate twenty-five children each—girls on one side, boys on the other. As in a court of a smaller Cambridge college, three doors lead from the courtyard to either wing, though the dormitory plan above does not admit of separate staircases. Each door is emphasised by a little pedestal of stone steps with a flagged walk leading to it, giving a most picturesque and charming effect.

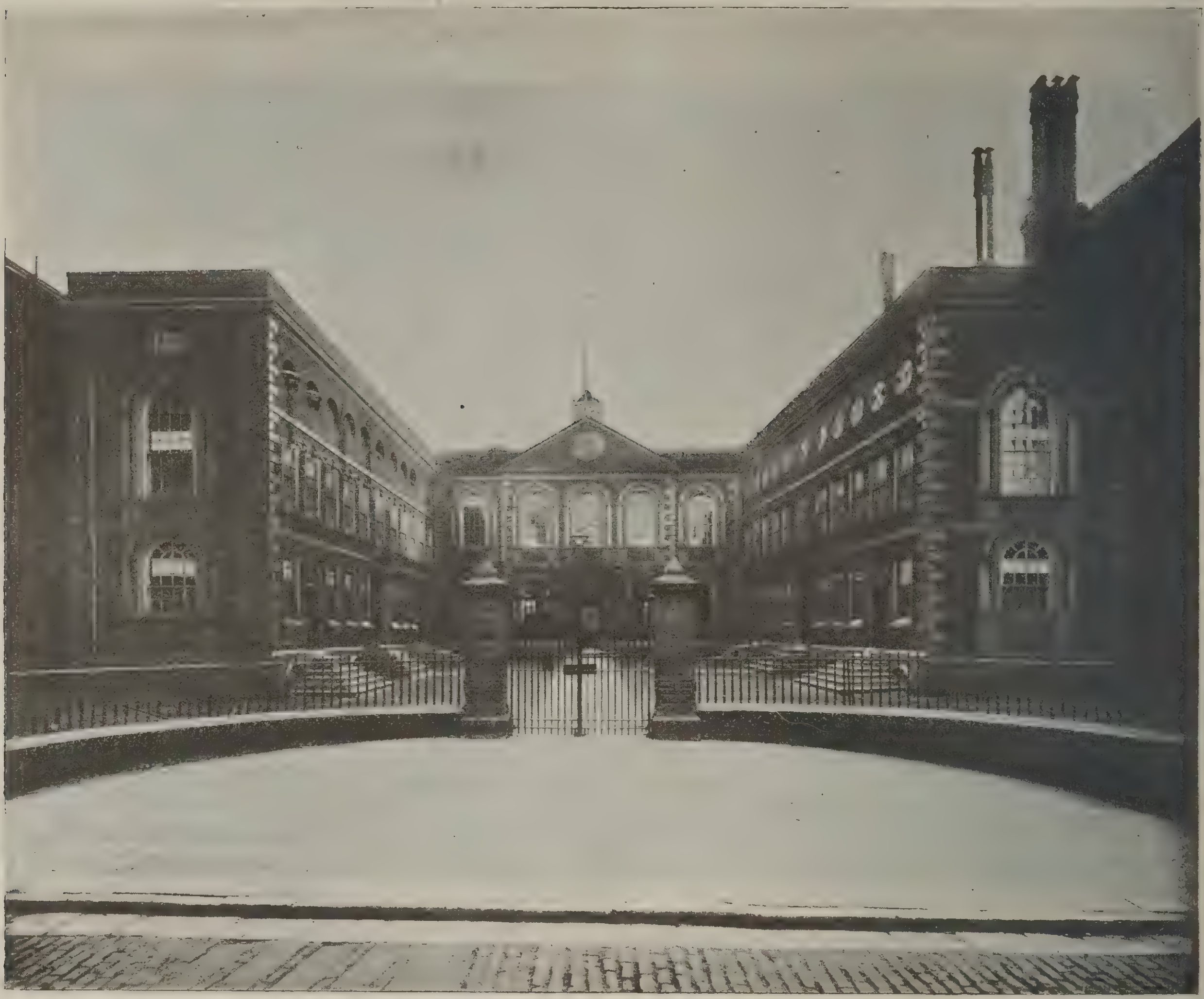
The windows in the flank walls, which are in excess in glass area of many a modern building and give ample light for studio purposes to the interior, are set well to the face of the brickwork, and by their broad frames and astragal bars carry through the sense of wall surface without any feeling of weakness. Indeed, these side façades offer a very practical solution of the problem of an office building where light is important, for even the rooms with the oval windows are well and pleasantly lit. Externally, the frieze of the elliptical windows under the cornice, well set in a field of plain brickwork, is a delightful feature.

The materials are small, hand-made red bricks and local sandstone. Liverpool, like the rest of the North of England, suffers from Ruabon red pressed bricks, so that on the score of brickwork alone the building was worth saving. The windows are glazed throughout with blown crown glass.

I have been unable to ascertain the name of the architect or master builder, but the detail is the traditional detail of the period, with just a hint of Inigo Jones's influence in the main doorway opposite the entrance gates.



An interesting motto on the chapel frieze, "Christianæ charitati promovendæ inopique pueritiæ ecclesiæ angli-



OLD BLUE COAT SCHOOL, LIVERPOOL.

canæ principiis imbuendæ sacrum anno salutis MDCCXVII," explains the original purpose of the building—a motto we mean to keep now that the purpose is changed.

I find from old accounts the cost of the building in 1717 was only 2,000*l.* to 3,000*l.*; the agreed purchase price to-day is 24,000*l.* to 25,000*l.* But in the eighteenth century the accounts also show it was possible to feed, clothe and educate a boy at the hospital for 8*l.* 12*s.* a year, while his architectural successor to-day costs 30*l.* That the training of the latter, however, will be the better for his new surroundings is not too much to hope for, and at any rate the thanks of architects are due to Mr. Lever not only for saving so fine a building from the imminent destruction that threatened it, but also for giving it to the service of our profession.

## WATERPROOF PORTLAND CEMENT.

That substances can be added to Portland cement to render it undeniably waterproof, even under pressure, we have pointed out in our leading article this week, and in confirmation of our statement that such compounds ordinarily do not weaken, but augment the strength of cement mortar, whether used as rendering, or as the matrix of concrete, we may refer to particulars before us of a series of tests by Messrs. Henry Faija & Co., whose reliability is unquestionable. These were made with "Solita," and summarised, give the results that an average of five samples of cement mortar, three parts sand to one cement, tested after seven days, showed an average tensile strength per square inch of 360 lb. without "Solita," and 368 lb. with "Solita." Tests after fourteen days with similar cement mortars gave an average of 421 lbs. without "Solita," and 425 lbs. with "Solita." The conspicuous advantage of a waterproof Portland cement that is actually stronger than one not waterproof is self-evident.

## THE CONCRETE INSTITUTE.

The deputation of members of the Concrete Institute have returned from Paris, where they have been making a special inquiry into the durability of reinforced concrete. For this purpose visits were paid to about a dozen important structures in and near Paris, including bridges, culverts, tunnels, reservoirs and buildings, all of reinforced concrete. These were of various ages, the oldest being the roof of a large house constructed no less than fifty-eight years ago by the late M. Coignet, whom many consider to have been the first inventor of this material.

The programme of visits was arranged by Professor Rabut, the chief engineer for new works of the French State Railways. The deputation were specially invited to dine with the Association des Ingénieurs des Ponts et Chaussées. In the absence of the President the visitors were received by M. Colson, Membre de Conseil de l'Etat, a former Inspector-General of this distinguished corps.

The visitors were also hospitably entertained by the Chambre Syndicale des Constructeurs en Ciment Armé, whose President, M. Edmond Coignet, is a son of the famous inventor, and by M. Hennebique.

The deputation consisted of Sir Henry Tanner, I.S.O., F.R.I.B.A., Mr. William Dunn, F.R.I.B.A., Mr. F. A. White, Mr. A. Ross, M.Inst.C.E., Mr. C. H. Colson, M.Inst.C.E., Mr. W. G. Kirkaldy, A.M.Inst.C.E., Mr. J. S. E. de Vesian, M.Inst.C.E., Mr. F. E. Wentworth-Sheilds, M.Inst.C.E., Mr. E. P. Wells, J.P., Mr. H. K. Dyson, Mr. H. K. G. Bamber, A.Inst.C.E., F.C.S., Captain Gibson-Fleming, R.E., Mr. G. C. Workman, Mr. P. W. Leslie, Mr. H. Anderson, and Mr. P. M. Fraser, A.M.Inst.C.E.

It is understood that the deputation were well satisfied with the results of their inspection, which will form the subject of a special report.

## MANCHESTER INFIRMARY SITE.

A MEETING of the Royal Infirmary Site Special Committee of the Manchester Corporation was held on Monday, the 11th inst., when a material step was taken towards ariving at a decision as to the disposal of the site. The Committee agreed to recommend the Council to adopt a scheme for the erection of a central library and a new art gallery only upon part of the area, and to authorise them to proceed with the necessary preparations for obtaining competitive designs from architects, with power to offer suitable premiums.

The report, which will be presented to the City Council on April 27, is as follows:—

At a meeting of the Council held on December 18, 1907, three reports of the Special Committee re Manchester Royal Infirmary site were submitted and considered, and the following resolution was adopted by the Council:—

"That the reports now submitted be approved, and that the Special Committee be instructed to prepare for submission to this Council a scheme embodying instructions to architects for competitive designs of a new building to be erected upon the Infirmary site for the purpose of meeting the requirements of the Libraries Committee, the Art Gallery Committee, and any other committee or committees which may be hereafter determined by the Council on the recommendation of the Special Committee."

The instruction embodied in such resolution was repeated in the resolutions appointing the Special Committee on November 9, 1908, and November 9, 1909.

Your Committee have held several meetings, and inquiries were made as to whether or not the Corporation are under restrictions as to the area or character of buildings which may be placed upon the old Infirmary site. As the result of these inquiries it has been ascertained that the Manchester Corporation Act, 1903, which vests the property in the Corporation, contains the following enactment, viz.:—

S. 68. The Corporation may, as and when they obtain possession of the said land, buildings, and hereditaments, appropriate the same or any portions thereof for public streets and open spaces as they may determine, and may also remove the existing buildings and erect and provide upon the said land such new buildings as they may determine with all necessary fixtures, fittings, furniture and equipment.

This power has not been modified by any other enactment, nor has any agreement or obligation on the subject been entered into by the Corporation. But in the report of the Special Committee dated August 30, 1906, and presented to the Council on September 5, 1906, after referring to the above enactment, the following paragraph appears:—

"It should be explained that the above provisions were obtained after the Council had received and approved on March 18, 1903, a report of the Special Committee, in which it was pointed out that the Infirmary authorities were desirous of selling their property in consequence of a decision of the trustees not to rebuild upon the present site; that public opinion was favourable to its acquisition upon reasonable and equitable terms with a view to the site remaining for all time as an open space unencroached upon by buildings of greater magnitude than those then existing."

Your Committee, believing that the Council would wish to keep well within the spirit of such paragraph, instructed the City architect to prepare a scheme of rebuilding to cover an area of about 5,500 square yards, and it having been ascertained that a building of reasonable height to meet the combined requirements of the Libraries Committee, the Art Gallery Committee, the Tramways Committee, and the Watch Committee would require a minimum area of 7,700 square yards, your Committee determined to present a scheme for the erection of a central library and art gallery only upon the area.

As regards the purposes of any buildings, the following resolution of the Council adopted on March 17, 1909, was submitted to your Committee, viz.:—

"That in the opinion of this Council any proposal for the utilisation of the Royal Infirmary site, or any buildings thereon, must provide for the occupany or use of such site or buildings for public purposes under the control of this Council."

Such resolution was repeated in the Committee's appointment made on November 9, 1909.

In compliance with the foregoing instructions and resolutions, the city architect has submitted a scheme for the erection of a library and art gallery. The proposed building will occupy an area of not more than 5,500 square yards, and the estimated cost of the new building will not exceed 250,000*l*.

Your Committee have carefully considered the city architect's report and plans, and they now submit them to the Council as a general outline of the scheme required by the above-mentioned resolution of the Council adopted on December 18, 1907.

Your Committee recommend the Council to adopt the scheme of building proposed in this report, and authorise the Committee to proceed with the necessary preparations for obtaining competitive designs from architects, with authority to offer suitable premiums therefor.

## TO PAY OR NOT TO PAY?

WHETHER an architect, having executed certain plans according to instructions, should refrain from asking for payment for them because the buildings were not erected, formed the subject of a heated discussion at the meeting of Bermondsey Board of Guardians on Thursday of last week.

Two years ago the Board instructed their architect, Mr. Newman, to report upon alternative schemes for rebuilding a workhouse at Tanner Street, or enlarging another institution so that the Tanner Street inmates might be transferred to it, and to submit sketch plans of his proposals.

The Board, for reasons of their own, shelved both schemes, and then because they had made no use of the plans objected to paying the bill, which at 1¼ per cent. on the estimated cost amounted to 1,392*l*. Negotiations followed and continued until the expiry of the old Board, when Mr. Newman, in order to get the matter settled offered to take 1 per cent., or 1,090*l*., providing that it was paid within a week, and that should the buildings be afterwards erected it should be considered as a payment on account.

When this offer came before the Board on Thursday one member, a Mr. Marryatt, was good enough to declare it would be a disgrace to the Board if the money was paid.

A Mr. Clarke, overlooking the work necessary to the production of a plan, which he was probably totally unable to appreciate, said they were paying the price of old masters for eight "penny bits of pasteboard."

Still another member, a Mr. Burton, moved a resolution to offer the architect 500*l*. or nothing, and it would be difficult to say where the matter would have ended but for the common sense of the Finance Committee's chairman, who plainly told the Board that they had ordered the plans with their eyes open, and would have to pay, if not willingly, at the order of a County Court Judge.

Even then the vote was only forced through with difficulty, the malcontents loudly declaring they would not sign the cheque.

## VARIETIES.

THE Ramsgate Educational Authority are about to erect at a cost of about 5,000*l*. another new school.

THE Congress of Chile have passed a law providing for the expenditure of about 90,000*l*., on the erection of public buildings.

THE Elgin Burgh School Board have decided to expend 2,500*l*. in additions and alterations at the Academy. The plans provide for six new rooms.

MR. BROWNRIGG, architect, 17 Clifford's Inn, Strand, W.C., has prepared plans for a new Secondary school for girls, which is about to be erected in Peterborough.

IN connection with the opening of the Brussels Exhibition which is to take place on Saturday, April 23, the Great Eastern Railway Company has arranged on and from to-day to issue cheap return tickets, first class 38*s*. 6*d*., second class 24*s*., available for fourteen days, viâ Harwich and Antwerp.

THE Edinburgh Town Council have adopted the recommendation by the electric lighting committee for the erection of three cooling towers at Dewar Place station, and the provision of exhaust steam turbines, &c., at a probable cost of 45,000*l*.

THE design of Messrs. R. B. Macoll & C. E. Tonge, architects, of Southport and Bolton, has been accepted by the Library Committee of the Wallasey District Council for a new building to be erected at Earlston at an estimated cost of 7,000*l*.

MESSRS. WILLIAM BAIN & CO., of Lochrin Ironworks, have taken off ten acres of ground at Souterhouse (Drumpellier estate), N.B., for the purpose of erecting a wire mill. Another well-known company are looking out for ground for a sheet mill.

THE Labour Department of the Board of Trade report that during March, in the building trades, employment, though still slack generally, was better than both a month ago and a year ago. The percentage unemployed among trade union carpenters and plumbers was 8.9 at the end of March, as compared with 10.6 in February and 13.3 a year ago.

The Agricultural and Horticultural College at Holmes Chapel is to be enlarged by the Cheshire Education Committee at a cost of 6,000*l.*

Mr. H. E. Clifford, F.R.I.B.A., Glasgow, has been appointed architect for the offices to be built for the Glasgow School Board on the site of the existing premises.

Messrs. Jenkins & Co., of Retford, have secured a contract for over 30,000*l.* for the erection of a gas plant for the Tokio Gas Company in Japan. The contract was secured after keen competition.

Mr. C. H. B. Quennell, F.R.I.B.A., has moved his offices to 21 Great Peter Street, Westminster, S.W., in the buildings of the National Society. His telephone number is Westminster 6162.

The Manchester City Council have authorised their Electricity Committee to obtain borrowing powers for 40,000*l.* for an extension of the undertaking.

The Whitehaven Town Council have decided to spend 2,340*l.* on new plant at their electricity works, and to apply to the Local Government Board for sanction to borrow 2,500*l.* for mains extensions.

A new school, accommodating 810 pupils, which was opened in Whitby Road, Sheffield, in August of last year, is to be enlarged, at a cost of 5,000*l.*, by the addition of a third department to accommodate a further 440 children.

Paisley Town Council intend to construct a new reservoir at Rowbank, near Howwood, at a cost of between 40,000*l.* and 50,000*l.* This will provide three and a half months' supply, bringing the total storage capacity for the town up to eight months' supply, which, it was explained, should meet the needs of the community for the next twenty years.

The Newton Abbot Urban Council have approved of the Surveyor's plans for the improvement of the market, comprising the construction of six lock-up shops, the erection of a market manager's house, and the conversion of the slaughter-house into a fire brigade station, at a total estimated cost of 1,200*l.*

Mr. N. G. Gedye, chief assistant to Mr. W. T. Douglass, civil engineer, Westminster, was yesterday appointed chief engineer to the Tyne Improvement Commission. Mr. Gedye, though only thirty-five years old, has had much experience in engineering work in Brazil, Peru, Mexico, and the Argentine. The annual salary attached to his new post is 1,500*l.*

Hamilton Dean of Guild Court last week passed plans presented by Mr. Thomas Weir, Quarry Street, for the erection of a steel workshop for the manufacture of nuts, bolts, and screws. The new works, which are to be built on the town lands near Hamilton West C.R. Station, will occupy 1¼ acres of ground. In extent the building will be 180 feet by 40 feet.

Mr. R. H. Mew, F.R.I.B.A., of the firm of Messrs. Alexander R. Stenning & Partners, 121 Cannon Street, E.C., has prepared a report on the condition of the thirteenth century church of St. Helen, Bishopsgate. He recommends the immediate renovation of portions of the interior and exterior stonework, and of some exterior brickwork, the repair of stained-glass windows, the renewal and painting of ironwork, and the cleaning and oiling of woodwork. The heating apparatus also requires renovation.

The Edinburgh Provincial Committee for the Training of Teachers propose to get additional ground at Moray House to provide (1) a central building containing in addition to all necessary accommodation for the training of the students, administrative offices and meeting rooms for the committees, and (2) a new demonstration school. The scheme will involve a sum of over 60,000*l.* Mr. A. K. Robertson, architect, has been instructed to prepare plans and specifications.

A Parliamentary return has been furnished showing the number of persons employed in slate quarries in North Wales during each of the years 1900 to 1909 inclusive. In 1900 the total number of slate miners was 5,041, of whom 2,295 were employed underground and 2,746 above ground. In slate quarries the total in 1900 was 9,481, 4,015 being employed inside and 5,466 outside. The total number employed in slate mines in 1908 was 3,301, those employed underground numbering 1,368 and above ground 1,933, while in slate quarries 8,056 persons were employed, 3,212 of whom were inside and 4,844 outside. In 1909 there were 3,118 employed in slate mines, 1,202 underground and 1,916 above ground, and in slate quarries 7,826 in all, of whom 3,105 worked inside and 4,721 outside.

The Leeds and Yorkshire Architectural Society on Wednesday evening, April 13, held the annual and first general meeting of session 1910-1, Mr. Sydney D. Kitson, M.A., F.R.I.B.A., the new president, taking the chair. The report read by Mr. Ralph W. Thorp, A.R.I.B.A. (hon. secretary), and the balance-sheet presented by Mr. R. Fielding Farrar, A.R.I.B.A. (hon. treasurer), both showed the Society's affairs to be in an eminently satisfactory state. The total membership was 167, against 165 last year. During the past session a town planning committee had been formed with the object of locally influencing the working of the Housing and Town Planning Act; while under the auspices of the Society the School of Architecture in connection with the School of Art was proving of advantage to Associates in preparing them in the subjects required for the R.I.B.A. examinations.

The half-yearly general meeting of the Liverpool Master Builders' Association was held on the 14th inst., Mr. R. Arthur Costain (president) in the chair. The President gave a résumé of the proceedings of the Council and various committees during the last six months, particularly mentioning the formation of (1) the Builders' Exchange; (2) the reference list which has been established with regard to architects, quantity surveyors, clerks of works, and specialists, &c.; (3) negotiations with the Lancashire County Council and the Liverpool Corporation with regard to equitable conditions of contract. The suggested alterations to the rules were unanimously carried, changing the term "honorary member" to "associate member," which includes the merchants engaged in the building trade as associate members and allows six associate members as representatives on the General Council of the Association.

A permanent exhibition of building materials and appliances was established at Montreal last year by the Master Builders' Association of that city, and is stated to be in direct touch with architects, contractors, proprietors, and prospective buyers. The exhibition is divided into fourteen classes—viz.—(1) Stone, all kinds except artificial; (2) bricks, cement, terra-cotta, and artificial stone; (3) lumber, interior and exterior woodwork; (4) wrought and cast iron, plain and ornamental; (5) sheet metal work, plain and ornamental; (6) roofing slate, tile, slag, &c.; (7) sanitary appliances, plumbing, steam fittings, radiators, steam heating, &c.; (8) heaters, ranges, grates, &c.; (9) plastering, metal lathing, substitutes for plaster; (10) ornamental tiles, fire-places, mantels, interior decorations; (11) hardware and artistic metal work; (12) stained, cut, plate, and ornamental glass; (13) paints, colouring, varnishes, &c.; and (14) gas fixtures, electric lighting, bells, tubes, &c. A certain space, varying in different classes, but generally about 72 square feet, is allotted to each exhibitor at an annual charge of $2½ per square foot. The room containing the exhibits is open for a certain number of hours each day, and in this way the goods of the exhibitors are advertised. In connection with the exhibition the association have recently established a reference library of trade catalogues relating to the building industry. There might here, it is suggested, be an opportunity for British manufacturers of building materials and appliances to exhibit their goods or catalogues. Communications on this subject should be addressed to His Majesty's Trade Commissioner, 120 Board of Trade Building, Montreal, or to the Secretary, Department of Permanent Exhibits, Builders' Exchange, Montreal.

The artistic sense of Venice has, says the British Consul in his annual report, been devoted to restoring, at any rate to some extent, the glories of the Campanile. The brick masonry of St. Mark's tower has been finished and the building of the belfry is being proceeded with. A new scaffolding has been fixed and the old one will soon be removed. The magnificent piece of architecture called the "Loggietta," as it was slightly elevated from the ground by Sansovino, is being reconstructed under the arches of the courtyard of the Doges' Palace. After its collapse measures were at once taken to collect all the precious fragments that could be recovered. Fortunately the bronze statues by Sansovino representing Minerva, Apollo, Mercury, and a God of Peace, together with the gates by the founder Gai, were not much damaged, and they were again put up in their pristine state. The terra-cotta Madonna with Child and St. John Baptist, also by Sansovino, that had been picked up in 1,600 fragments, was wonderfully restored by Pietro Zei. A great part of the material constituting the façade of the loggietta, such as columns, pedestals, pilasters, niches, &c., has been, wherever possible, restored or identically replaced. Its reconstruction may now be seen, minus the attic, which is now under reconstruction in another place, and will soon be removed there. With respect to the marbles and other materials employed, a most careful selection has been made, with a view of insuring an identical reproduction of the splendid monument that was buried under the debris of the Campanile.

THE

# Architect and Contract Reporter.

FRIDAY, APRIL 29, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 COLMORE ROW.

⁂ *Entered in the United States of America as second-class matter.*

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*The International News Co.,* 5 *Bream's Buildings, Chancery Lane, London, England, and New York.*

AGENTS FOR CANADA:

*Messrs. WM. DAWSON & SONS, Ltd., Manning Chambers, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.*

*Subscription* $5.20.

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

EDINBURGH.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

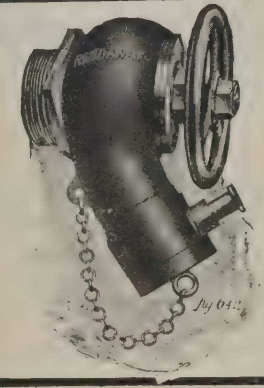
LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

PONTEFRACT.—April 29.—The Education Authority invite competitive designs for an elementary school from architects practising in Yorkshire. Deposit 1*l.* 1*s.* Mr. W. Haddock, town clerk.

RICHMOND.—May 21.—The Town Advancement Association offer prizes of twenty guineas and five guineas for a double-royal poster exploiting the attractions of the town. The Offices of the Association, 1 The Little Green, Richmond, Surrey.

STOCKPORT.—May 2.—Architects desirous of competing for the designs of the library which the Corporation propose to erect are invited to send their names, with information as to their experience in and qualifications for carrying out such work, to Mr. Robert Hyde, town clerk, Town Hall, Stockport.

WALSALL.—Designs are invited for the erection of a public elementary school (mixed) to accommodate 500 children at Bloxwich. Conditions of competition and plan of site from Mr. W. Dawson Sadler, M.A., Director of Education, Council House, Walsall.



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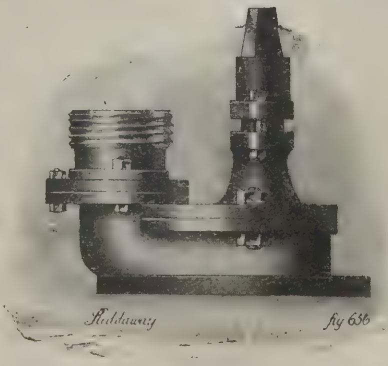

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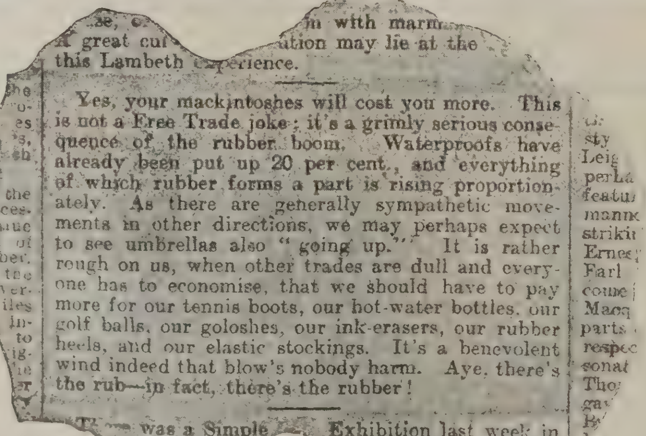

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a great cu... ...ution may lie at the
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## CONTRACTS OPEN.

Barrow-in-Furness.—May 3.—For erection of a manual instruction centre at the junction of Duke Street with Ramsden Street. The Borough Engineer and Surveyor's Office, Town Hall, Barrow-in-Furness.

Bradford.—May 9.—For erection of woolcombing shed, warehouses, engine and boiler house, chimney, &c., Canal Road. Messrs. Moore & Crabtree, architects, York Chambers, Keighley.

Brentford.—May 3.—For erection of a cottage in Clifden Road, adjoining the public baths. Deposit 1*l*. Mr. J. W. Croxford, the engineer and surveyor to the Council, Clifden House, Boston Road, Brentford.

Bridgend.—May 7.—For erection of a board room and offices at the Workhouse. Mr. P. J. Thomas, architect, Bridgend.

Cambridge.—May 4.—For erection of two cottages in Albion Row. Borough Surveyor, Guildhall, Cambridge.

Campsall.—May 4.—For erection of walls, fencing, gates, and other work in connection with the new burial ground at Campsall, near Doncaster. Mr. J. Green, Norton, Doncaster.

Chelmsford.—May 9.—For the execution of the following subsidiary work in connection with the Trinity Road Council school in course of erection:—Supplying and fixing floors of steel and coke breeze concrete. Mr. W. H. Pertwee, architect, The Institute, London Road, Chelmsford.

Chelmsford.—May 30.—For additions and alterations to school premises at the King Edward VI. Grammar School. Deposit 5*l*. Quantities will not be supplied. Messrs. Charles & W. H. Pertwee, architects, Chelmsford.

Coventry.—May 11.—For erection of a public elementary school to accommodate 1,254 children, at Mile Lane. Send 1*l*. deposit by April 29 to the Education Offices, Priory Row, Coventry.

Durham.—May 17.—For alterations and improvements at East Hedley Hope, Springwell, Lanehead, South Church and Etherley infants' Council schools. Mr. F. E. Coates, Shire Hall, Durham.

Ebchester.—May 2.—For erection and completion of alterations and additions to the St. Ebba's Church. Mr. Geo. Thos. Wilson, architect, 22 Durham Road, Blackhill.

Epsom.—May 10.—For erection of a nurses' home, and for alterations to the girls' home at Woodcote, Epsom. Deposit 10*s*. 6*d*. Also for the carrying out of certain alterations in the kitchen and adjoining offices. Deposit 1*l*. 1*s*. Mr. A. C. Williams, architect, 53 Doughty Street, W.C.

Evenwood.—May 2.—For the several works required in erection and completion of detached villa, stables, &c., at Evenwood, near Bishop Auckland. Mr. Geo. Thos. Wilson, architect, 22 Durham Road, Blackhill, co. Durham.

Foxhole.—May 7.—For erection of a Council School at Foxhole, Cornwall. Mr. B. C. Andrew, architect to the Committee, Biddick's Court, St. Austell.

Gateshead-on-Tyne.—May 6.—For erection of a river police station on land situated at the south-west end of the Swing Bridge, for the Tyne Improvement Commissioners. Deposit 3*l*. 3*s*. Messrs. Fenwicke & Watson, architects, Pearl Buildings, Northumberland Street, Newcastle.

Glasgow.—May 3.—For the following work in connection with the reconstruction of Glasgow Justiciary Courts, viz.:—(1) Excavator, mason, brick, &c., works; (2) carpenter, joiner, and glazier works; (3) slater work; (4) plumber work; (5) plaster work. Deposit 4*l*. 4*s*. for each of the schedules for mason and joiner works, and 2*l*. 2*s*. for each of the schedules for other works. Messrs. Robert Scott & Son, measurers, 115 Wellington Street.

Glasgow.—May 7.—For the construction of a goods shed, 1,640 feet long by 100 feet wide, on Meadowside Quay, Partick. The Clyde Navigation Trustees' engineer, 16 Robertson Street, Glasgow.

Glasgow.—May 9.—For the erection of industrial hall and offices in connection with the Scottish Exhibition, Glasgow, 1911. Deposit 5*l*. 5*s*. Messrs. Walker & Ramsay, 123 Wellington Street, Glasgow.

Glasgow.—May 7.—For the following works required in connection with the proposed alterations and additions to the observation ward at Ruchill Hospital, viz.:—Excavator, brick and mason works; wright work, slater work, plumber work, plaster and tile work, and painter work. Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.

Halifax.—May 14.—For the execution of the following works required in erection of a police station with three cells, inspector's house, and quarters for six single constables at the junction of Burnley Road and Warley Road, King Cross, viz.:—(1) Mason's, excavator's, and bricklayer's; (2) carpenter's and joiner's; (3) plumber's and glazier's; (4) slater's and plasterer's; (5) concreter's; (6) painter's; (7) electricians'; (8) steelwork; (9) reinforced concrete and asphalte roofing; and (10) heating. Deposits as follows, viz.:—10*l*. for No. 1, 5*l*. each Nos. 2, 3, and 9, and 1*l*. each for Nos. 4, 5, 6, 7, 8, and 10. Mr. James Lord, borough engineer, Halifax.

Handsworth.—May 2.—For erecting a mess room, cottage, &c., at the cemetery, Camp Lane. Deposit 1*l*. 1*s*. Mr. H. Richardson, A.M.Inst.C.E., Council House, Handsworth, Staffordshire.

Hanley.—For erection of biscuit placing houses, dipping houses, warehouses, &c. Apply by letter to Messrs. E. L. Maddock & Sons, architects, Hanley, Staffs.

Hartlebury.—May 7.—For provision of all materials for, and erection of, new schools at Hartlebury, near Kidderminster. Deposit 2*l*. 2*s*. Mr. S. S. Reay, F.R.I.B.A., 4 Unity Street, College Green, Bristol.

Hayle.—May 7.—For erection and completion of Council school at Hayle, Cornwall. Mr. Sampson Hill, architect to the Committee, Green Lane, Redruth.

Hemel Hempstead.—May 7.—For erection and completion of two pairs of dwelling-houses and four pairs of cottages proposed to be built on sites fronting the London Road, Boxmoor. Messrs. Robinson & Mead, 66 Marlowes, Hemel Hempstead.

Heanor.—May 9.—For erection of proposed secondary school, Heanor, to accommodate 250 students. Deposit 1*l*. 1*s*. Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

Idle.—April 30.—For erection of a villa residence in Highfield Road, Idle, Bradford. Forward applications by April 30 to Mr. J. Harper Bakes, M.S.A., architect and surveyor, Calverley Chambers, Victoria Square, Leeds.

Ireland.—May 4.—For building a rectory at Lifford, County Donegal. Messrs. R. E. Buchanan & Co., architects, Castle Street, Londonderry.

Ireland.—May 7.—For erecting new wood ceiling and carrying out other improvements at Dunfanaghy Presbyterian Church. Messrs. Robinson & Davidson, A.R.I.B.A., architects and engineers, Richmond Street, Londonderry.

Ireland.—May 7.—For building and fencing twelve single labourers' cottages, for the Milford Rural District Council; cost of building and fencing each cottage not to exceed 117*l*. Mr. S. Watters, clerk, Milford, co. Donegal.

Ireland.—May 9.—For the erection of a doctor's residence and dispensary for Newcastle Dispensary District at Killadreenan, near Newtownmountkennedy. Mr. G. T. Moore, C.E., &c., 1 and 2 Foster Place, College Green, Dublin.

Isle of Man.—May 5.—For the mason's work, &c., required in the completion of tower and spire of Rose Mount Wesleyan Church, Douglas. Send 2*l*. 2*s*. deposit by May 5 to Mr. Josiah Goldsmith, Westwood, Somerset Road, Douglas, Isle of Man.

Leeds.—May 5.—For the supply, delivery, and erection of the constructional steel and iron work, &c., required for a locomotive engine shed on the sewage works at Knostrop. Deposit 1*l*. 1*s*. Mr. G. A. Hart, sewerage engineer, Great George Street, Leeds.

London.—May 2.—For erection of stables in Scotland Yard. Deposit 1*l*. 1*s*. Sir Henry Tanner, I.S.O., at H.M. Office of Works, Storey's Gate, S.W.

London.—May 3.—For providing and laying wood block flooring at school buildings, &c., for the London County Council. Persons desiring to submit tenders may obtain specification, form of tender, &c., at the Architect's Department, 8 and 10 Charing Cross Road, W.C.

Luton.—May 2.—For erection of school buildings to accommodate 350 children on Beech Hill, Dunstable Road. Deposit 1*l*. 1*s*. The Secretary to the Committee, Town Hall, Luton.

Manchester.—May 2.—For the construction of reinforced concrete floors, &c., at the proposed baths at Burton Road, Withington. Deposit 1*l*. 1*s*. The City Architect, Town Hall, Manchester.

Manchester.—May 4.—For alterations to the boiler house at the Swinton schools. Deposit 10*s*. 6*d*. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

Newcastle-upon-Tyne.—May 3.—For erection of ten cottages, Woodthorne Road, for the North-Eastern Railway Co. Mr. William Bell, the company's architect, Central Station, Newcastle-on-Tyne.

Penponds.—May 7.—For erection of proposed Council school at Penponds, Cornwall. Mr. Sampson Hill, architect to the Committee, Green Lane, Redruth.

Penshaw.—May 6.—For building 10 houses behind Burn Terrace, Shiney Row, Penshaw Station, Durham. Mr. Palliser, architect, Philadelphia, Lime Depôt.

Pontefract.—May 4.—For the erection of shop, warehouse, and house at Moorthorpe, for the Pontefract Industrial Society, Ltd. Forward names to Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford.

Prestolee.—May 7.—For erection of an elementary school for 510 children, with accommodation for the teaching of domestic subjects and manual instruction, at Prestolee, near Bolton. Deposit 2l. Mr. Henry Littler, County Architect, 16 Ribblesdale Place, Preston.

Salford.—May 2.—For the construction of a covered way to connect the municipal secondary school for girls and the education office. The Director of Education, Education Office, Chapel Street, Salford.

St. Mewan.—May 7.—For erection of a new church room at Sticker, for the Rector and Churchwardens of St. Mewan, Cornwall. Mr. B. C. Andrew, M.S.A., architect, Biddick's Court, St. Austell.

Scotland.—May 2.—For executing the mason, carpenter, glazier, smith, plumber, plasterer, asphalter, and slater works of proposed addition to the Higher Grade School, Gordon Schools, Huntly. Mr. John Dickson, Clerk to the School Board, Huntly, or Messrs. Kelly & Nicol, architects, 367 Union Street, Aberdeen.

Scotland.—May 9.—For the mason, carpenter and joiner, plumber, slater, plaster, and iron and smith work of new female hospital and male closed block proposed to be erected at the Crichton Royal Institution, Dumfries. Messrs. Sydney Mitchell & Wilson, architects, 13 Young Street, Edinburgh.

Scotland.—May 16.—For brickwork, joiner, plaster, slater, plumber, and gas-fitting for three cottages to be built at Bowhill, Cardenden. Mr. David Burt, Station Road, Cardenden.

Shieldfield.—For building a retaining and boundary wall at Shieldfield Council school. The Secretary, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

Snailbeach (Shrewsbury).—May 4.—For stripping and re-slating the roof and other repairs to the Primitive Methodist Church. Rev. Gervase Hall, Minsterley.

South Bank.—For proposed pulling down and rebuilding the Anchor Inn, Cleveland Street, South Bank, Yorks. Mr. W. T. Aggutter, architect, Horsemarket, Darlington.

Southport.—May 5.—For alterations and additions required at the Water Board Offices, Portland Street. Deposit 1l. 1s. Mr. Alleyne Brown, clerk, 11 St. George's Place, Lord Street, Southport.

Stairfoot.—May 5.—For slater, plumber, plasterer, and painter's work required in erection of two houses, Doncaster Road. Messrs. Jones Bros., contractors, Stairfoot, Yorks.

Swindon.—May 4.—For alteration to cloak-room and painting and decorating at several schools. Mr. W. Seaton, Secretary to the Education Committee, Education Office, Town Hall, Swindon.

Wales.—For erection of three large shops and offices in Mill Street, Pontypridd. Send 2l. 2s. deposit to Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and surveyors, Church Street Chambers, Pontypridd.

Wales.—May 2.—For alterations and additions to Trallwn bakery, Trallwn, Pontypridd. Deposit 2l. 2s. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

Wales.—May 2.—For alteration and extension of premises at Ystrad, Rhondda, for the Pentre Conservative Club. Mr. J. Rees, architect, Pentre.

Wanstead.—May 4.—For the erection of a foreman's cottage at the Wanstead Sewage Farm, Empress Avenue, Manor Park. Deposit 1l. Mr. C. H. Bressey, surveyor, Council Offices, Wanstead, N.E.

Wales.—May 4.—For the following works, for the committee of visitors of the Glamorgan County Asylum:—(1) Alterations and additions to slaughter-house at Angleton Asylum; (2) alterations to and re-slating cowhouse at Parc Gwyllt Asylum; (3) alterations to stables for isolation boxes at Parc Gwyllt Asylum; (4) conversion of cart shed into stables and fodder store. Mr. W. E. R. Allen, clerk to the committee of visitors, Glamorgan County Council Offices, Westgate Street, Cardiff, or Mr. P. J. Thomas, architect, Bridgend.

Wales.—May 6.—For erection of a new post office at Llanelly, for the Commissioners of H.M. Works and Public Buildings. Deposit 1l. 1s. The Postmaster, Llanelly, or H.M. Office of Works, Storey's Gate, London, S.W.

Wales.—May 6.—For building a new stores at Pentre, St. Clears, Carmarthen. The Greenfield Stores, St. Clears, Carmarthen.

Wales.—May 7.—For erection of a new chapel and vestry on site of existing building of the Tabernacle C.M. Chapel, Penclawdd. Deposit 2l. 2s. Messrs. Evans & Jones, architects, Greenfield, Llanelly, and at Port Talbot, or with Mr. Morgan Morgans, Manchester House, Penclawdd.

Wales.—May 7.—For building a dwelling-house at Rhosfach, Rhoshill, Pembroke. Apply at Wenvoe, Rhoshill.

Wales.—May 9.—For alterations, additions, and renovations to Tabernacle Chapel, Pontypridd. Deposit 2l. 2s. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

Wales.—May 10.—For erection of eleven pairs of semi-detached villas and 34 houses near intermediate schools, Ebbw Vale, for the Blaen Ebbw Building Club. Mr. Wm. Harris, architect and surveyor, Bank Chambers, Bargoed.

Wales.—May 10.—For erection of new premises at Tylorstown, for the Ferndale Industrial Co-operative Society. Deposit 2l. 2s. Messrs. W. Morgan Lewis & T. Naunton Morgan, architects and surveyors, Pontypridd.

Warley.—May 5.—For the mason's, joiner's, plumber's, slater's, plasterer's, and concreter's work required in erection of a detached residence at Warley Town, Halifax. Messrs. Walsh & Nicholas, architects and surveyors, 10 Harrison Road, Halifax.

Yorks.—May 6.—The West Riding education committee invite whole or separate tenders for the following works, viz.:—Hensall Council school: alterations and additions; Denby and Cumberworth Birdsedge proposed Council school: builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Deposit 1l. in each case must be sent to the West Riding Treasurer, County Hall, Wakefield.

# TENDERS.

## BRISTOL.

For an extension to a cold-storage warehouse, Jarvis Street, Barton Hill. Mr. F. Bligh-Bond, F.R.I.B.A., Bristol.

| | | | |
|---|---|---|---|
| Watts | £1,127 | 0 | 0 |
| Love | 1,100 | 0 | 0 |
| Wilkins & Son | 1,054 | 0 | 0 |
| Neal & Williams | 1,030 | 0 | 0 |
| Ridd & Sons | 996 | 0 | 0 |
| Bray | 992 | 8 | 0 |
| Downs & Son | 990 | 0 | 0 |
| Williams & Son | 985 | 0 | 0 |
| Humphreys & Son | 981 | 0 | 0 |
| Hayes & Sons | 975 | 0 | 0 |
| Chown | 952 | 10 | 0 |
| Walters & Son | 949 | 10 | 0 |
| Tanner & Son | 947 | 0 | 0 |
| Blake | 940 | 0 | 0 |
| Lovell & Son, Bristol (*accepted*) | 895 | 0 | 0 |

## CAMBRIDGE.

For rebuilding Newton Hall. Mr. Fred W. Foster, architect, 26 Bedford Row. Quantities by Mr. L. H. G. Stanbrough, 26 Bedford Row, W.C.

| | | | |
|---|---|---|---|
| Mills & Sons | £14,298 | 0 | 0 |
| Bell & Sons | 13,947 | 0 | 0 |
| Longley & Co. | 13,649 | 0 | 0 |
| Sindell | 13,500 | 0 | 0 |
| Foxley & Co. | 12,994 | 0 | 0 |
| Carmichael | 12,975 | 0 | 0 |
| Minter (*accepted*) | 12,975 | 0 | 0 |

## CHELTENHAM.

For the erection of a farm house and farm buildings at the Crippetts, near Cheltenham. Mr. Thomas Malvern, architect, Cheltenham.

| | | | |
|---|---|---|---|
| Mills & Son | £2,553 | 12 | 5 |
| Drew | 2,195 | 0 | 0 |
| Wilson | 1,981 | 0 | 0 |
| Collins & Godfrey | 1,974 | 0 | 0 |
| Skemp | 1,925 | 0 | 0 |
| Billings & Sons | 1,883 | 0 | 0 |
| Saunders & Sons, Cirencester (*accepted*) | 1,827 | 15 | 6 |

### DEVONPORT.

For the erection of three cottages, Alfred Place. Mr. E. M. Leest, architect, Devonport. Quantities by Messrs. Leest & Adams, Devonport.

| | | | |
|---|---|---|---|
| Lethbridge | £665 | 17 | 6 |
| Pile & Son | 618 | 10 | 0 |
| Stanbury | 575 | 0 | 0 |
| Pearce Bros. | 574 | 0 | 0 |
| Smith & Son, Devonport (*accepted*) | 569 | 15 | 0 |

### GLASGOW.

For the provision of mahogany bookcases at the new Mitchell Library.

| | | | |
|---|---|---|---|
| Wylie & Lochhead (*accepted*) | £5,359 | 1 | 6 |

For the rubber, tile, and marble works at the library.

| | | | |
|---|---|---|---|
| Galbraith & Winton, Glasgow (*accepted*) | £3,785 | 1 | 1 |

### HORSHAM.

For the construction of a public convenience, &c., on the Crown Inn site.

| | | | |
|---|---|---|---|
| Lindfield & Son | £156 | 0 | 0 |
| W. Potter | 145 | 0 | 0 |
| Peters | 140 | 0 | 0 |
| G. Potter | 139 | 0 | 0 |
| Hillman & Murrell | 138 | 0 | 0 |
| Rowland Bros. (*accepted*) | 133 | 0 | 0 |

### IRELAND.

For erection of a residence and dispensary at Ballycastle, for the use of the medical officer of the Cushendall Dispensary District, for the Guardians.

| | | | |
|---|---|---|---|
| Dallat | £960 | 0 | 0 |
| H. & W. Miskimmon | 945 | 0 | 0 |
| Douglas | 926 | 0 | 0 |
| M'Cann, Ballymena (*accepted*) | 876 | 0 | 0 |

### KEIGHLEY.

For the several works (except joiner's and painter's) required in the erection of three pairs of semi-detached cottages at Morton Banks, for the Keighley Industrial Co-operative Society, Ltd. Messrs. John Haggas & Sons, architects, Keighley.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Turner, Utley, near Keighley, mason | £680 | 0 | 0 |
| Lodge, Keighley, plumber | 195 | 17 | 6 |
| C. & D. Antrum, Keighley, plasterer | 136 | 3 | 8 |
| W. H. & E. Walton, Keighley, slater | 120 | 10 | 0 |

### KINGSTON-ON-THAMES.

For house, shop and electric bakery. Mr. G. Smith, surveyor.

| | | | |
|---|---|---|---|
| Oldridge & Sons | £1,867 | 0 | 0 |
| Charles | 1,844 | 0 | 0 |
| Gaze & Sons | 1,758 | 0 | 0 |
| Hawkey | 1,625 | 0 | 0 |
| Ide & Son | 1,539 | 0 | 0 |
| Feltham (*accepted*) | 1,527 | 0 | 0 |
| Brewerton | 1,193 | 0 | 0 |

### LONDON.

For external painting and decorating at the Licensed Victuallers' Asylum, Old Kent Road, S.E., consisting of 176 houses, chapel, board-room, library, and lodges, &c. Mr. W. F. Potter, architect. Quantities by Mr. C. R. Griffiths, surveyor, 4 & 5 Warwick Court, Gray's Inn, W.C.

| | | | |
|---|---|---|---|
| F. & H. F. Higgs | £1,221 | 0 | 0 |
| Holloway | 1,140 | 0 | 0 |
| Hall | 1,039 | 0 | 0 |
| Small & Sons | 998 | 0 | 0 |
| Sabey & Sons | 992 | 0 | 0 |
| Sharpin | 899 | 10 | 0 |
| Dearing & Sons | 885 | 0 | 0 |
| Ansell | 880 | 0 | 0 |
| Osborn & Son | 838 | 16 | 0 |
| Crabb & Son | 770 | 0 | 0 |
| Hollingsworth | 740 | 0 | 0 |
| King & Son | 724 | 5 | 0 |
| Maskell & Son | 715 | 0 | 0 |
| Renwick | 712 | 0 | 0 |
| Eames | 614 | 0 | 0 |
| Pickard | 560 | 0 | 0 |
| Garner | 521 | 10 | 0 |
| Dawes, Peckham Rye (*accepted*) | 495 | 0 | 0 |

For restoring the gas candelabra to the above chapel at the Asylum in Tabary cement.

Dreyfus & Co., Featherstone Street (*accepted*).

### LONDON—*continued.*

For setting back the railings and fences in connection with the widening of Woolwich Road to the east of Rainton Road, for the L.C.C.

| | | | |
|---|---|---|---|
| Smith | £860 | 0 | 0 |
| Holloway | 721 | 0 | 0 |
| F. & H. F. Higgs | 663 | 0 | 0 |
| Triggs, Clapham (*recommended*) | 586 | 0 | 0 |

### LOWER SANDHURST.

For the enlargement of the Council school at Lower Sandhurst, Berks., by three classrooms.

| | | | |
|---|---|---|---|
| Aldridge | £1,779 | 16 | 10 |
| Drowley & Co. | 1,679 | 0 | 0 |
| Martin, Wells & Co. | 1,620 | 0 | 0 |
| Watson | 1,582 | 0 | 0 |
| Tydeman Bros. | 1,571 | 17 | 11 |
| Seward | 1,537 | 0 | 0 |
| Love | 1,534 | 0 | 0 |
| Fitt, Reading (*recommended*) | 1,487 | 0 | 0 |

*Teachers' room and store.*

| | | | |
|---|---|---|---|
| Aldridge | 372 | 1 | 6 |
| Fitt (*recommended*) | 365 | 0 | 0 |
| Drowley & Co. | 350 | 0 | 0 |
| Watson | 348 | 0 | 0 |
| Love | 345 | 0 | 0 |
| Martin, Wells & Co. | 340 | 0 | 0 |
| Seward | 336 | 0 | 0 |
| Tydeman Bros. | 320 | 5 | 0 |

### MALTON.

For the erection of the Grammar School on Broughton Road.

| | | | |
|---|---|---|---|
| Oldfield & Sons, Malton (*accepted*) | £3,911 | 5 | 5 |

### ROUGHAM.

For work at new schools at Rougham, Norfolk. Mr. H. J. Green, architect and diocesan surveyor, Norwich.

| | | | |
|---|---|---|---|
| Spragg | £1,085 | 6 | 0 |
| Shanks | 1,075 | 0 | 0 |
| Youngs & Son, Norwich (*accepted conditionally*) | 1,059 | 0 | 0 |

### SALHOUSE.

For alterations and additions at the non-provided schools, Salhouse, Norfolk. Mr. H. J. Green, architect and diocesan surveyor, Norwich.

| | | | |
|---|---|---|---|
| Youngs & Son | £593 | 0 | 0 |
| Stowers & Son | 580 | 0 | 0 |
| Hannant | 577 | 0 | 0 |
| Tooley & Youngs | 569 | 0 | 0 |
| Riches, Postwick (*accepted conditionally*) | 547 | 0 | 0 |
| Sparkes & Latten | 537 | 10 | 1 |

### SPITALGATE.

For pulling down and rebuilding cells with court room at Spitalgate police station, Lincs. Mr. Jesse Clare, county architect, Sleaford.

| | | | |
|---|---|---|---|
| Parks & Son | £706 | 0 | 0 |
| Maxey & Son | 654 | 0 | 0 |
| Benstead & Son | 631 | 5 | 9 |
| Hackley & Co., Grantham (*accepted*) | 597 | 0 | 0 |
| Parker & Son | 596 | 10 | 0 |

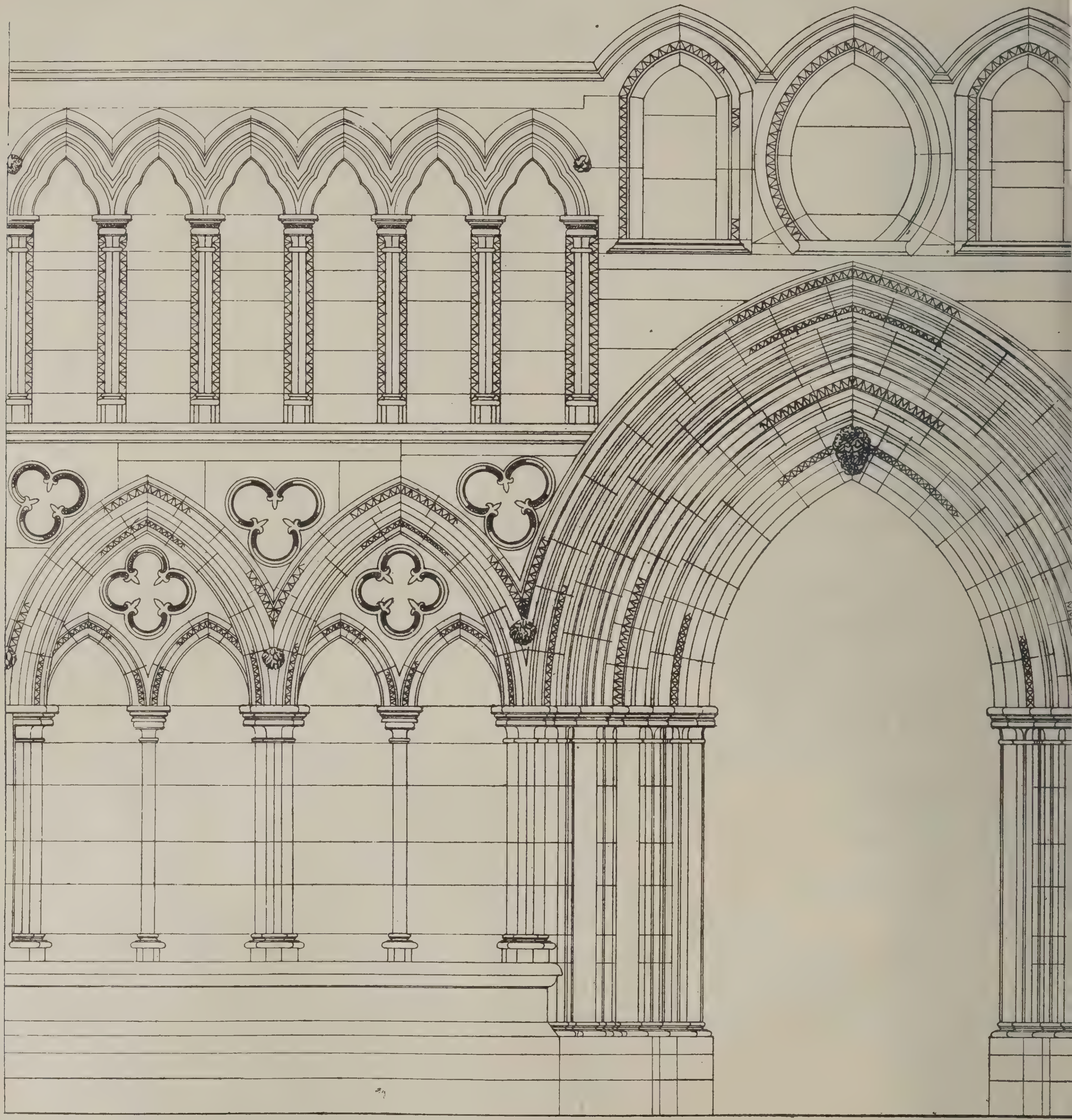
### THURNSCOE.

For the flagging, surface draining, channelling and kerbing of footpaths in Lidget Lane, Back Lane, Shepherd Lane, and High Street, Thurnscoe, Yorks. Mr. R. Higginbottom, surveyor.

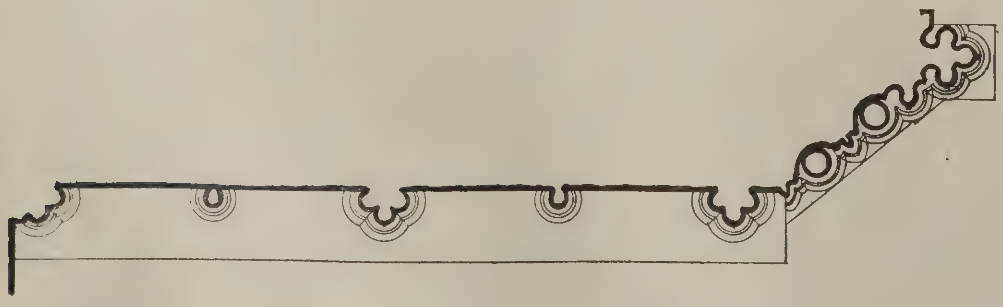
| | | | |
|---|---|---|---|
| Rhodes Bros. | £2,645 | 0 | 0 |
| Hannan & Co. | 2,380 | 0 | 0 |
| Pickles Bros. | 2,300 | 0 | 0 |
| Green & Sons | 2,255 | 0 | 0 |
| Wade | 2,224 | 17 | 1 |
| Roberts | 2,223 | 0 | 0 |
| Dickinson | 2,185 | 0 | 0 |
| Haigh | 2,150 | 0 | 0 |
| Dryden | 2,128 | 17 | 7 |
| Walker | 2,127 | 13 | 1 |
| Clements | 2,094 | 0 | 3 |
| Eyre, Hillsborough, Sheffield (*accepted*) | 2,070 | 0 | 0 |
| Lawton & Pounder | 2,066 | 2 | 7 |

"THE ARCHITECT" STUDENTS'

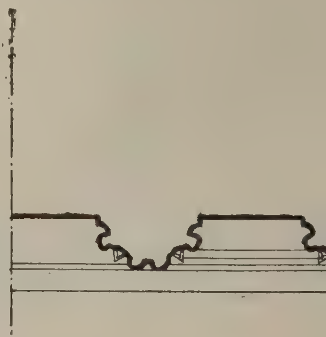
# 13TH CENTURY WEST FRONT · BOLTON



ELEVATION.

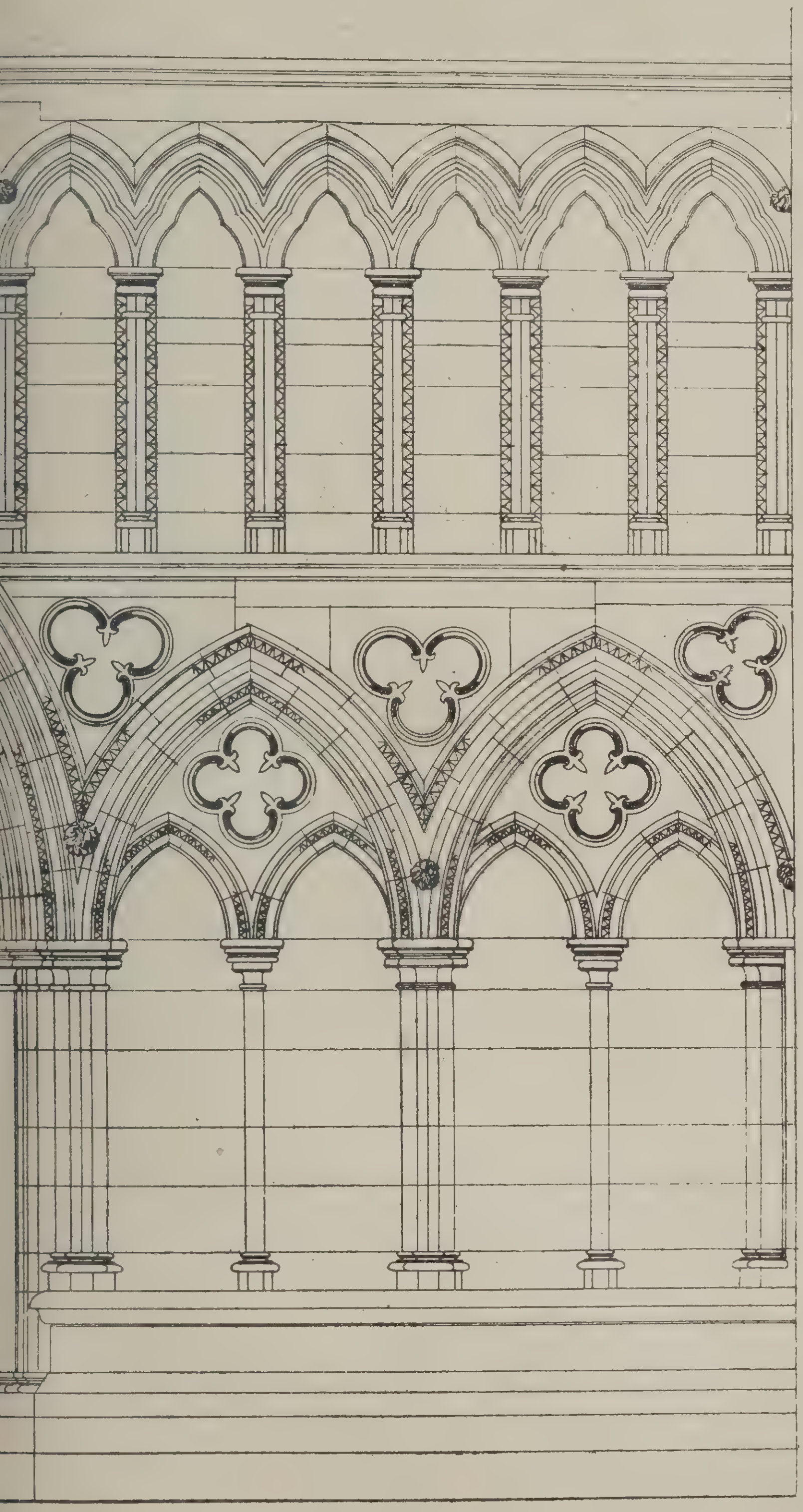


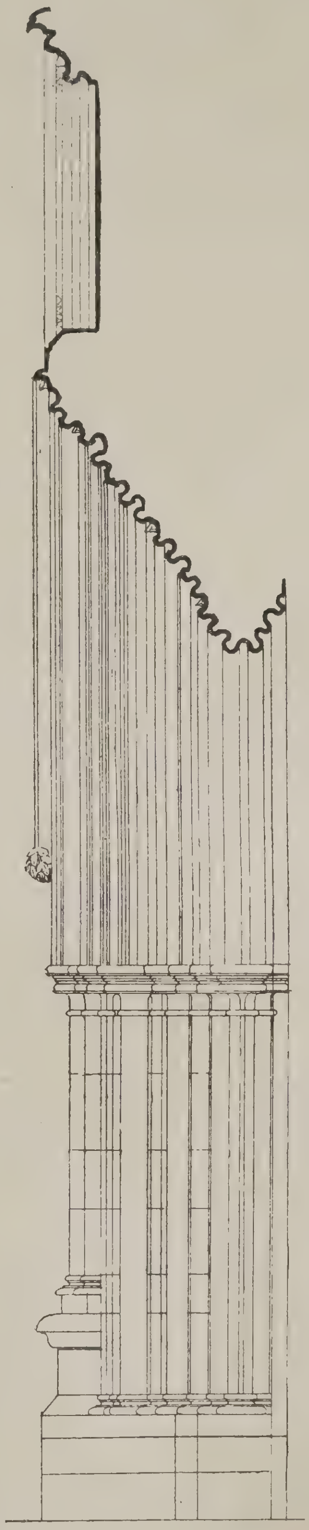
PLAN: LOWER ARCADE.



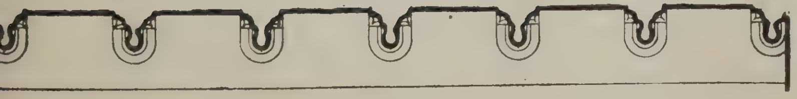
PLAN: UPPER ARCA

# ABBEY · YORKSHIRE · LOWER PORTION ·





SECTION.



MEASURED AND DRAWN BY "ESEK."

## BOLTON ABBEY, YORKSHIRE.

THE drawings represent the lower portion of the thirteenth century west front of Bolton Priory, Yorkshire. The Priory was founded about 1120 A.D., at Embsay, near Skipton, by the regular canons of St. Augustine, but some 30 years later was removed to its present situation. In plan the church takes the form of a Latin cross. The portion west of the crossing is used for service, the remainder is in ruins, probably on account of the rule that the nave was reserved for public use while the choir was kept exclusive for the canons. A good deal of Norman work remains in choir and transepts, and some fine wall arcading. The upper portion of the choir and transepts appears to have been rebuilt and Decorated windows inserted.

The nave retains much of its Early English character: the aisle is divided from it by four arches, and in the clerestory over are four lancet lights. The thirteenth century west front is perhaps the most beautiful of all the work, and is in a good state of preservation, owing to the protection afforded by the tower erected in the sixteenth century, but not completed before the Reformation. Had it been completed we should probably have had no thirteenth century west front, as the tower would probably have been connected to the nave. The presence of the tower makes measured work on the front very difficult, and no permission is granted for measurement or sketching inside the nave.

## COMPETITION.

SHEFFIELD.—Messrs. Morgan & Brace, architects, London, have been placed first in a competition organised by the Endcliffe Park Congregational authorities for designs comprising a church for 650, an institute school, and caretaker's apartments. The premium is 35*l*., and will not be merged in the commission. The assessor, Mr. Chas. Hadfield, F.R.I.B.A., placed second the design submitted by Messrs. W. Waddington & Sons, Manchester, and that of Messrs. Withers & Meredith, FF.R.I.B.A., London, third.

## TRADE NOTES.

A LARGE clock has just been completed for the Griffith John College, Hankow, Central China, which is fitted with Lord Grimthorpe's gravity escapement, striking hours, all up to date improvements added, by Messrs. W. F. Evans & Sons, Soho Clock Factory, Handsworth, Birmingham. The same firm have also completed three new turret clocks, and reconstructed three others, all for the North Shields Corporation, and also a turret striking clock for the Victoria Hospital, Damascus, Syria.

THE extensions to the Royal Infirmary, Sheffield, are being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

THE Rex Roofing Co., Connswater, Belfast, have issued a small booklet dealing with their circular bow-and-string girder roof, which has come to be known as the "Belfast" roof. Single spans up to 100 feet are erected without intermediate support, and without bringing any lateral thrust upon the side walls. That is to say, it is cheap because the framework itself is of the lightest possible description, and cheap because the rest of the building can be designed on equally economical lines. The Rex flat roofing is in six layers, three being of their sheet asphalte, and three layers of Rex mastic applied in a liquid state. This roofing has on numberless occasions withstood the severest tests as to water-tightness, strength and durability. The felt does not require tarring oftener than once in three years. The Rex Roofing Co. do not claim that their roofs are incombustible, but the cases quoted below show the confidence with which they are regarded by engineers. The smithy of Messrs. Harland & Wolff, Ltd., at their White Star Shipbuilding Works, and the smithy and foundry of Messrs. Tangyes, Ltd., Birmingham, are covered with Belfast roofs; and in the latter case the furnace chimneys and cupolas come through the roofs. Messrs. Combe, Barbour & Combe, Belfast, have their cupolas quite close to their felt roofs. Messrs. Gregg, Sons & Phœnix's cupola and felt roof are within 2 feet of each other.

EDINBURGH Dean of Guild Court has granted an interim warrant for additions to the Edinburgh Hospital for Women and Children. The additions consist of extra wards and a new operating theatre.

## SAFES AND STRONG ROOMS.

IT is quite possible that the contents of His Majesty's private safe are of less value than those of many others far humbler. Yet to our mind there is something arresting in the announcement of the fact that among the works carried out by Messrs. Hobbs, Hart & Co., Ltd., was the King's private safe. It rather dwarfs such contracts, probably more important, as providing a self-contained and burglar resisting steel strong room in the private apartments at Windsor Castle, or that of erecting a suite of plate rooms, jewel room and jewel safe for Queen Victoria; still more does it dwarf the long list of important banking firms and commercial offices to which safes have been supplied. However, as already hinted, the reason for this is something akin to the sentimental, and flights of sentiment or fancy are directly opposed to the consideration of safes. The fact does remain, nevertheless, that the firm have been honoured by Royal appointment, and have also fitted treasury doors, reserve bullion safes, and principal doors for the head office and branches of the Bank of England. With such strong testimonials it seems superfluous to speak as to the quality of their work.

The gentle art of the burglar has to be met with a cleverness greater than his own. The body of the improved "Progress" D quality safe, for instance, is of ½-inch solid steel, flanged and bent at all angles and corners, the back plate being placed in position inside the body during the process of bending, and securely rivetted to the back flanges. The door is of Hobbs & Co.'s compound high and low carbonised steel, and best quality tough steel, to a thickness of 1¼ inches, the exterior plate being hardened drill proof. The lock-case is angle steel, dovetailed and rivetted together at the four corners and rivetted to the door by self hardening steel rivets. The door is secured by a series of patent "clutch" bolts. In the smaller sizes these are fitted at the front and back; in the larger sizes and in all double door safes they are fitted at all four sides of the doors. The system of "clutch" bolts is controlled by two of their "protectors" nine lever unpickable and gunpowder proof locks with two keys each. Fire resisting chambers of full capacity, charged upon Hobbs & Co.'s improved system, the chemical ingredients being packed in cartridge cases and the whole of the materials thoroughly dried to prevent rusting of the inner lining.

Messrs. Hobbs & Co. are not content with this, for they have other anti-burglar aids such as a special compound steel for doors, and a patented protection against the oxy-acetylene blow-pipe. Their "branch bank" strong room door is a combination of the best expedients for safety. It is not by the manufacture of safes alone that the firm have gained their reputation. One of their recent most successful productions is a "penny in the slot" automatic lavatory latch. This is made in two types; one will contain up to seventy-two pennies, and the other up to 144.

## INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

THIS Society held its usual monthly meeting on Thursday, the 21st inst., at the Society's House, 7 Dean's Yard, Westminster Abbey, S.W.

Grants of money were made in aid of the following objects, viz.:—Building the church of St. Anne, Longsight, near Oldham, 200*l*.; rebuilding Holy Trinity, Kingsway, Middlesex, 200*l*.; and towards reseating and repairing Chelsea Old Church, Middlesex, 75*l*.; and Hanborough, St. Peter, near Oxford, 25*l*. The following grants were also paid for works completed:—Martley, St. Peter, Worcester, 50*l*.; Leytonstone, St. John the Baptist, Essex, 75*l*.; Kirkdale, St. Gregory, Yorks, 25*l*.; Wrenbury, St. Margaret, 15*l*.; Fincham, St. Martin, Norfolk, 20*l*.; Canton, St. Luke, Cardiff, 100*l*.; Silk Willoughby, St. Denis, Lincs., 30*l*.; Honington, All Saints, Suffolk, 30*l*.; and Cynllwyn-du, St. David, Glamorgan, 50*l*. In addition to this the sum of 234*l*. was paid towards the repairs of twenty-six churches from trust funds held by the Society.

The grants voted during the present year, amounting to 4,450*l*., have nearly exhausted the funds at the disposal of the committee. Liberal contributions are invited to enable the committee to vote substantial grants and to enable them to continue the valuable work which this Society has so successfully carried on during the past ninety-two years.

The annual general court will be held at 3 P.M. on Thursday, May 26, at the Church House, Dean's Yard, Westminster, when the chair will be taken by the Archbishop of Canterbury, president of the Society.

## ILLUMINATING ENGINEERING SOCIETY.

A MEETING of the above Society was held on Wednesday evening, the 14th inst., in the hall of the Royal Society of Arts, Professor S. P. Thompson, D.Sc., F.R.S. (President), in the chair, to resume the discussion on "Recent Developments in the Measurement of Light and Illumination," adjourned from a meeting held on March 15.

The following series of queries on the subject was prepared and issued to members in order to suggest a few points on which discussion would be valuable:—

1. Are the courses of instruction and experimental facilities at technical colleges and scientific institutions for the study of photometry adequate, and what changes are desirable in the existing methods to suit modern requirements?

2. What is the maximum sensitiveness (*i.e.* the smallest percentage change of illumination perceptible to the eye) at present obtainable from photometrical instruments in the laboratory? How should this sensitiveness be tested and expressed, and to what extent does it differ in the case of different individuals? In what directions may improvements be anticipated in the future?

3. What are the best modern methods of obtaining the polar curves of light-distribution and of measuring the mean spherical candle-power of different sources, and what possibilities are there of simplifying and improving such processes in the future? What are the best methods of deriving the mean spherical or mean hemispherical candle-power from such curves in the case of all illuminants?

4. As it is desirable that there should be international agreement on the subject of the commonly accepted method of measuring and expressing the intensity of illuminants of all kinds in order that results referring to different sources may be comparable one with another, on what basis should such comparisons of illuminating power be made, and what information should be included in a report of tests of this nature? Is it desirable that all lights should be compared in terms of mean spherical candle-power?

5. What is the best method of comparing the intensity of modern sources of light which differ in colour?

6. What are the main qualifications of an illumination-photometer for practical work? With what degree of accuracy can the illumination in streets and buildings be measured, and what limits of accuracy should at present be permissible?

7. Discussion of the exact value and significance to be attached to photometrical measurements in streets and buildings, and the possibility of framing and carrying out a specification relating to the conditions of illumination in such cases. To what authority is it desirable that dispute regarding such specifications and photometrical measurements should be eventually referred?

8. What are the best methods of studying and measuring daylight illumination?

The PRESIDENT said, although the business before them was the continuation of the discussion of the meeting of March 15, it was desired that on the present occasion they should confine their remarks practically entirely to the measurement of illumination and to the carrying out of the principles they were discussing a month ago. They had hoped and expected that Sir William Preece would open the discussion, but his health did not permit him to attend that evening. Happily Sir William Preece was represented more or less by Mr. Trotter, who had long been associated with him in experiments. The President said he wished also to mention that they had upon the platform various illumination instruments, and he thought it would be well if they could have from the exhibitors early in the evening practical demonstration and illustration of those instruments.

Mr. A. P. TROTTER said, before commencing the subject of illumination in its more practical applications he would refer, as he had been asked to do, to some remarks contributed by Mr. Sumpner on the direct measurement of mean spherical candle-power by diffusion methods. Dr. Sumpner said the quantity of light emitted by any form of lamp was measured by its spherical candle-power. The determination of that quantity was of commercial importance and a simple method of making the test was much wanted. The best known direct test was by the use of the Ulbricht globe. That globe, no doubt, he said, yielded good results in practice, but it had some defects which prevented its action from being quite accurate. It was the purpose of the paper to which he made reference, said Mr. Trotter, to briefly allude to those sources of error and in particular to discuss whether it was possible to obtain equally good or better results by using in place of the globe merely a rectangular box. Time did not allow, said the speaker, a further account of Mr. Sumpner's argument, but for the benefit of members the paper would be published in the transactions of the Society.

Mr. Trotter said that the subject chosen for that meeting was the photometry of illumination. Query No. 6 of the paper which had been circulated was as follows:—"What are the main qualifications of an illumination-photometer for practical work? With what degree of accuracy can the illumination in streets and buildings be measured, and what limits of accuracy should at present be permissible?" A member had suggested at the last meeting that there appeared to be too many different kinds of photometers, and he seemed inclined to wait until the best one had been decided upon. There were many kinds of pens and many French dictionaries, but nobody put off learning to write or to study French for such reasons. The fact was that the large variety afforded opportunity for different persons to suit themselves. It would be found that there is no "best" photometer, but each person would generally do the best work with the instrument to which he was accustomed, and if he happened to be the inventor of one there could be no possible doubt which instrument he would prefer. He considered that the first of the qualifications of an illumination-photometer, which in fact distinguished it from a portable candle-power photometer, was the provision of a horizontal test-plate having no obstructions, but a clear view all round. Illumination might be measured by measuring successively the candle-power of each lamp which contributed to the illumination and then calculating the combined effect. Such measurements might be made on inclined test-plates, but the total could only be considered on a horizontal plane. Most illumination-photometers could be used also as candle-power photometers. Some instruments such as the Martens, Krüss, and one of Weber's were intended for measuring the illumination on school desks, or at a lathe or bench in a workshop, and the instrument itself obstructed half of the view from the test-plate, and in cases of general illumination might obstruct half of the light. Such instruments were very useful for certain purposes, but were not suitable for measuring illumination in streets, railway stations, &c. The second qualification of an illumination-photometer was that the test-plate should be as matt as possible, that is, have no appreciable glaze, and should obey the law of cosines as closely as possible, that is, it should have no appreciable angle errors. The third qualification was a good lamp. In Germany a small benzine lamp was often used. The height of the flame had to be adjusted carefully. It could not be used until it had burned for ten minutes, and he did not know how long it would burn without adjustment. He preferred a small electric lamp worked from an accumulator. If it were switched on only during each reading, which did not take more than 20 seconds, the total over a long evening's work would not amount to more than about half an hour. It was easy to ensure that the lamp would not vary more than 2 per cent. in candle-power during an evening. He did not believe in using voltmeters or adjustable resistances. The fourth qualification was a practical range. The maximum need not be more than 4 foot-candles, but the minimum should reach 0.02 or lower. The minimum illumination for street lighting is sometimes specified as 0.1 foot-candle. It may be interesting to measure the higher values, but in case the lighting is deficient the most important one to be able to measure accurately is the minimum allowed. It is quite possible to make very fair measurements of 0.005 foot-candle, but the scale of the instrument must be expanded at the lower part to make this possible. The fifth qualification is capability for dealing with coloured lights. The speaker's personal opinion was that the value of the flicker photometer was overrated, but he admitted that good work was done with it in some cases. He considered that the principle of free and rapid motion of the adjustment, whatever it was, of the instrument was sufficient for all practical purposes. The sixth qualification was a convenient arrangement for measuring the angle of incidence, and the last was the important one of portability. The second part of the query related to the degree of accuracy. Any good instrument set up on a tripod should be able to give an accuracy of 2 per cent. But it was useless to attempt high accuracy in outdoor work. Irregularities in glass globes, dirt, variation of gas or electric pressure, and other accidental causes introduced unknown errors. If on repeating a number of measurements it was found that they lay within a range of 5 or 6 per cent., that is, not more than 2½ to 3 per cent. from the mean of the whole, the work might be considered satisfactory.

Mr. Trotter then showed one of his illumination-photometers, made by Messrs. Everett, Edgcumbe & Co., and explained its use.

Mr. LANCELOT WILD described some investigations he had made in the measurement of the sensitiveness of photometers. The Joly prism (paraffin) he said, gave an equality of brightness of 2.5 per cent., the Summance wheel 2.4 per cent. and 1.6 per cent. flicker, the Whitman sector gave 2.0 per cent. and 1.0 per cent. flicker, inclined cards 1.2 per cent., common Bunsen (viewed on one side) 1.2 per cent., the same viewed on both sides 1.5 per cent., special Bunsen (38 lb. Ford) viewed on one side .4 per cent. and flicker .8 per cent., the same viewed on both sides gave .8 per cent. of equality of brightness and .2 per cent. flicker. In the last case he presumed the better surface in the wax used helped towards better results. Special Bunsen (60 lb. Ford) viewed on one side gave .8 per cent. equality of brightness and the same viewed on both sides 1.2 per cent. and .4 per cent. flicker, the Lummer gave .7 per cent. equality of brightness.

Mr. CLARKE, an inspector of the Gas Light and Coke Company, said so far as his experience with photometers went, starting with the common Bunsen disc he could not share the opinion which had been expressed by some about it for he had found the disc a very useful piece of apparatus indeed. One could work with it for long periods without fatigue, and another of its advantages was that it permitted adjustments to be made while one was looking at the screen.

Mr. H. HARRISON gave a demonstration with a photometer made to his order.

Mr. P. J. WALDRAM urged that the educational authorities should be asked to provide greater facilities for the teaching of Photometry. The study of illumination for architects in architectural schools was absolutely non-existent, and he therefore believed that one of the chief duties of that Society was to emphasise the crying need for including photometry in an architectural curriculum. An immense amount of responsibility was thrown upon an architect in determining not only the amount of daylight his buildings would admit, but also the artificial illumination of them. With the architectural student it was not the fault of his receiving insufficient instruction that placed him in difficulties, but the fact that he had received no instruction at all.

Mr. B. E. EDGCOMBE and Mr. BOXALL (Great Western Railway Company) briefly joined in the discussion, and on the motion of the President the meeting terminated.

## VARIETIES.

THE Littlehampton Rural District Council have agreed to erect a refuse destructor in connection with the Wick drainage pumping site, and tenders are to be invited for the work.

THE St. George's Road Congregational Church, Bolton, has decided to erect new schools. A site has been purchased, and over 2,500*l*. has been raised towards the cost.

THE Tiverton education committee have decided to invite architects experienced in that class of work to submit designs in competition for an elementary school for boys.

THE Edinburgh Corporation up to last week received nearly a hundred applications from architects all over the country for the Usher Hall competition.

THE Ilkeston Corporation propose to spend 3,700*l*. on the erection of two chapels, lodge, &c., at the Park Cemetery. A tender for the work has been acceptional conditional to the approval of th Local Government Board.

THE Wolverhampton Town Council at their last meeting adopted a report from the electricity committee recommending extensions of the generating station, the provision of further plant, and erection of fitter's workshops, &c. The cost was estimated at 23,000*l*.

THE Council of the Surveyors' Institution have accepted an invitation from their Lancashire and Cheshire committee to hold the next country meeting at Liverpool, on May 26 and 27. Visits have been organised to various works and places of interest in the locality.

PLANS for a proposed new technical school at Doncaster, prepared by Messrs. Schofield & Berry, of Leeds, have been adopted. The site of the school is at the old Vicarage near the parish church, and the cost of the building will be about 10,000*l*.

THE contract for the new school which is to be erected at Sutton Valence consequent on the amalgamation of the Sutton Valence and Westminster schools has been secured by Messrs. Wallis, Ltd., of Maidstone, the amount of whose tender was between 28,000*l*. and 29,000*l*. There were fourteen firms in competition for the contract.

THE building trade depression seems to be passing slowly away. A distinct improvement is perceptible in the Sheffield district. Makers of tools used for building report that things are a little better in this country, and Colonial buying has considerably improved. Makers of many kinds of edge tools are fairly well occupied. There is nothing to complain of in the spade and shovel department both for home and export. Stove-grate makers are benefiting somewhat, but they complain of recurring spells of slackness.

THE Derbyshire education committee have been informed that the Board of Education are not satisfied with the progress made by the committee in regard to school buildings and accommodation. A programme of new work was in contemplation, which will necessitate the immediate engagement of four additional temporary architectural assistants.

THE partnership hitherto existing between Messrs. T. E. Scammell & A. R. Perkins, architects and surveyors, 11 John Street, Bristol, and Wotton-under-Edge, has now been dissolved by mutual consent, and the business will be continued by the aforesaid T. E. Scammell, P.A.S.I., under the style of T. Scammell & Son.

THE *Diario Oficial*, Chile, of March 1, contains a law providing for the raising of a loan of 1,100,000*l*., to be applied, with the exception of about 123,750*l*., to the erection of the town hall and to sanitary works in Valparaiso. The former work has already been contracted for; the contract for the sanitary works is to be given as the result of public competition.

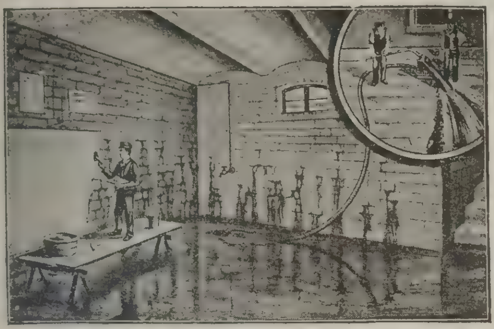
THE Welsh slate trade, which has been in a state of depression for the past five years, presents symptoms which point to an improvement of a permanent character. For about two years Oakeley quarries, the chief quarries in the Festiniog district, have been working four days a week. It was last week announced that full time would be resumed at the Oakeley quarries next week or the week after. Another sign is that of late ships in Portmadoc, the port of Festiniog, secure slate cargoes easily.

THE new church of St. Wilfrid, Bognor, was dedicated by the Bishop of Chichester on Saturday, April 23. The portion of the church completed consists of the chancel, chapel, vestries, organ chamber, transepts, and three bays of the nave, and with the addition of a temporary west end gives accommodation for 800 adults. The work has been carried out by Messrs. J. Jarvis & Sons, builders, of Hackney, at a total cost of about 8,000*l*., from the designs and under the supervision of Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., architect, of Westminster, S.W. The style is of fifteenth century type, and the materials used are Kentish rag external facing, with Box ground dressings and brick facing and Bath stone dressing internally.

THE Worshipful Company of Makers of Playing Cards offers "The Company's Prize" of 15*l*. 15*s*. for the best design for the backs of playing cards, illustrating the subject of "Locomotion: Past, Present, and Future." The "H. D. Phillips Prize" of 10*l*. 10*s*. is also offered by the company for the best design on any other subject. The designs selected are to be the absolute property of the company, and one will be reproduced for the pack of cards to be presented by the company to its livery and guests at the Inauguration Banquet. Designs must be sent in by June 24 to W. Hayes, the clerk of the company, Guildhall, London, E.C., from whom particulars of the conditions can be obtained.

ANOTHER turbine steamer, the *St. Petersburg*, intended for the Great Eastern Railway Company's Harwich-Hook of Holland service, was launched at Clydebank, N.B., on Monday. The new boat will be fitted with wireless telegraphy, submarine signalling, and all the modern improvements in respect to heating, ventilation and lighting. The vessel which is 343 feet long, 44 feet broad, will have a speed of 21 knots per hour, and accommodation for over 300 first-class passengers. A special feature is a number of cabins each fitted with accommodation for one person; the greater part of the remainder of the cabins will contain two berths only. The *St. Petersburg* is expected to be placed on the service in July, after which date there will be only turbine steamers.

YEAR after year the Shakespeare festival grows in importance and covers a longer period—this year from April 22 to May 14—when Stratford-on-Avon will give itself up to Shakespeare's plays, a number of which were no doubt conceived by the immortal bard in this old English town, with its old English people, and the old English tongue everywhere around you. Stratford-on-Avon is delightful in the sweet springtime. To enable those in the Metropolis to visit these scenes of Merrie England, the Great Central Railway Company have arranged a convenient service of express trains by their short route, and cheap tickets at the fare of 6*s*. 6*d*. return are issued from Marylebone several days during the week. The arrangements are specially suitable for attending the matinée performances in the Memorial Theatre on April 22, 26, 27, 28, 30, May 2, 3, 5, 7, 10, 11, 12, and 14, and visitors can return in good time the same evening.



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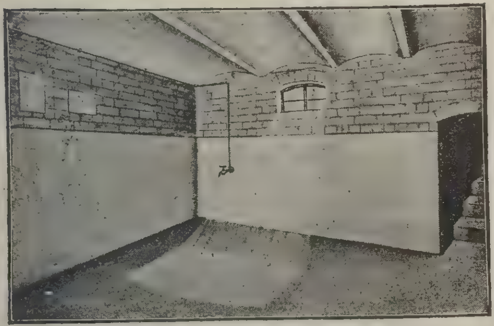

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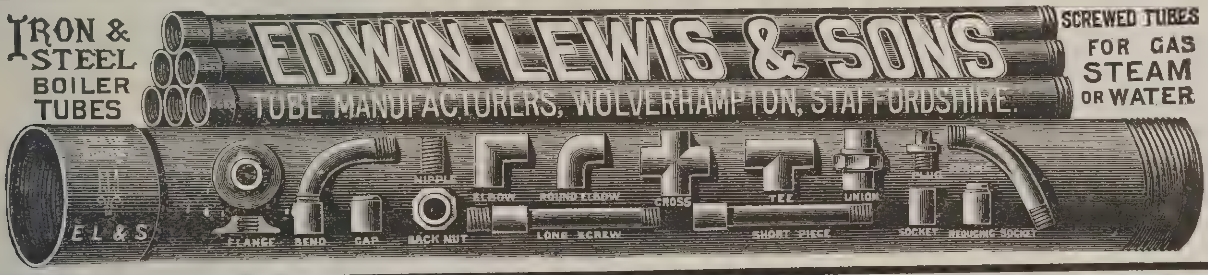

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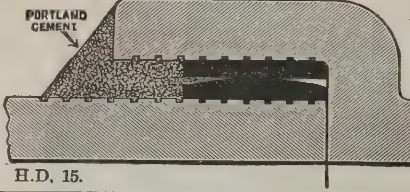

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THE

# Architect and Contract Reporter.

FRIDAY, MAY 6, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2* P.M. *on Thursdays.*

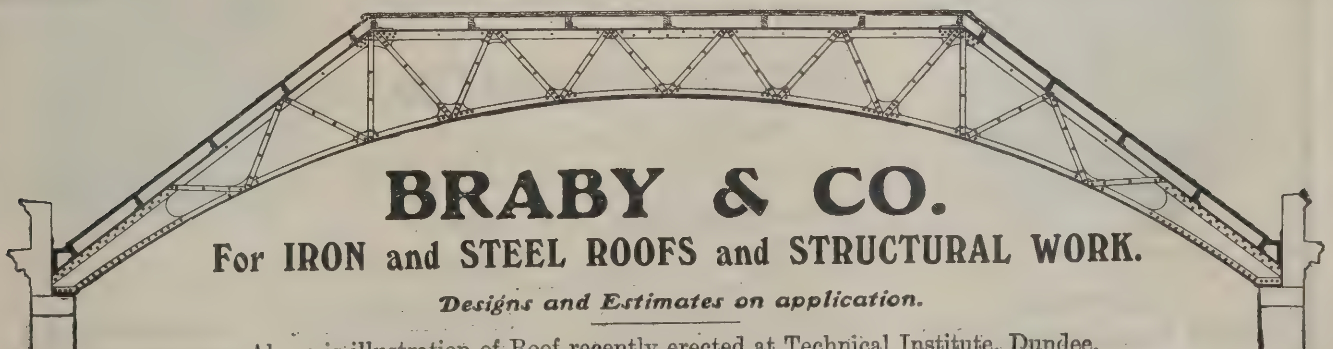
## COMPETITIONS OPEN.

EDINBURGH.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

RICHMOND.—May 21.—The Town Advancement Association offer prizes of twenty guineas and five guineas for a double-royal poster exploiting the attractions of the town. The Offices of the Association, 1 The Little Green, Richmond, Surrey.



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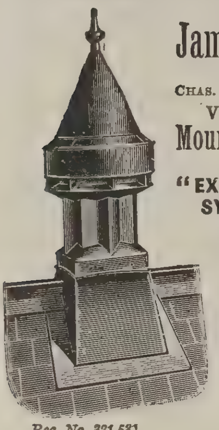
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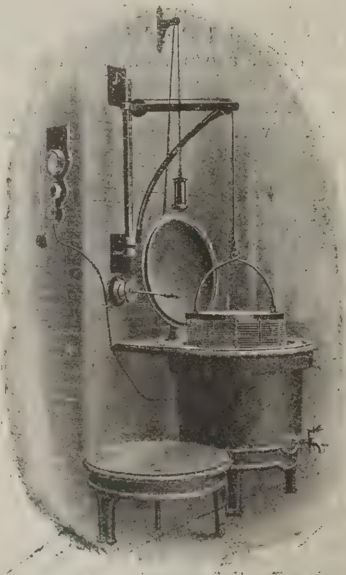
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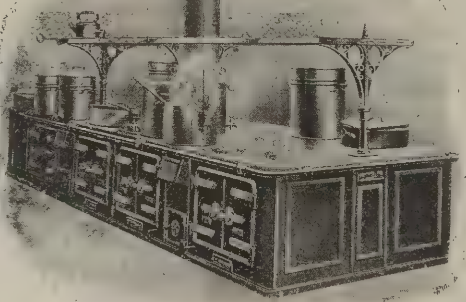
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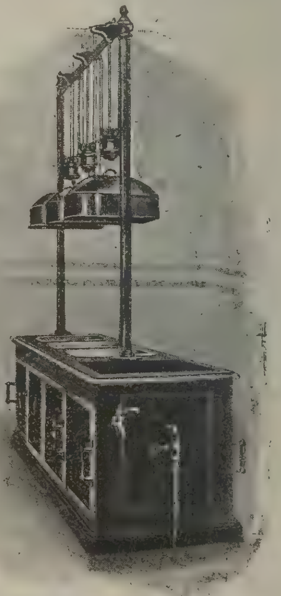
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## CONTRACTS OPEN.

Barnoldswick.—May 20.—The West Riding education committee invite whole or separate tenders for the following work, viz. :—Barnoldswick Gisburn Road, new infants' school (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

Batley.—May 10.—For the work of stripping and re-slating the roof of Healey Council schools. Mr. O. J. Kirby, borough engineer and surveyor, Town Hall, Batley.

Bradford.—May 9.—For erection of woolcombing shed, warehouses, engine and boiler house, chimney, &c., Canal Road. Messrs. Moore & Crabtree, architects, York Chambers, Keighley.

Bridgend.—May 14.—For alterations and repairs to the York Hotel, Bridgend. Mr. P. J. Thomas, architect, Bridgend.

Bridgnorth.—May 16.—For works of restoration and improvement at the North Gate. The Borough Surveyor's Office, Bridgnorth.

Brighton.—May 13.—For the construction of an overground lavatory and tram shelter at the north end of Victoria Gardens. The Borough Surveyor, Town Hall, Brighton.

Chelmsford.—May 9.—For the execution of the following subsidiary work in connection with the Trinity Road Council school in course of erection :—Supplying and fixing floors of steel and coke breeze concrete. Mr. W. H. Pertwee, architect, The Institute, London Road, Chelmsford.

Chester.—May 12.—For foundations for purifiers and sheds with drains and boarding, slating, glazing and flashing to roofs comprising about 1,250 cube yards of excavation, 380 cube yards of cement concrete ; 430 super yards of brickwork, &c., at the Roodee Gas Works, for the Chester United Gas Co. Deposit 1*l*. 1*s*. Mr. Fred A. Pye, secretary and general manager, Cuppin Street, Chester.

Darlaston (Staffs).—May 10.—For erection and completion of a Council school for 304 infants at Salisbury Street, and for the enlargement of Dorsett Road Council school, by 120 places. Deposit 1*l*. 1*s*. Apply on or before May 10 to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Dublin.—May 10.—For alterations to the staircase at their Amiens Street terminus, leading from the booking hall to the public street, and the building of a new telegraph office for the Great Northern Railway Co. (Ireland). Mr. F. A. Campion, chief engineer, Amiens Street terminus, Dublin, or the District Engineer, Belfast.

Durham.—May 17.—For alterations and improvements at East Hedley Hope, Springwell, Lanehead, South Church and Etherley infants' Council schools. Mr. F. E. Coates, Shire Hall, Durham.

Dublin.—May 17.—For the third section of the Bride's Alley Area Artisans' Dwellings. Deposit 2*l*. The City Architect, Municipal Buildings, Cork Hill, Dublin.

Epsom.—May 10.—For erection of a nurses' home, and for alterations to the girls' home at Woodcote, Epsom. Deposit 10*s*. 6*d*. Also for the carrying out of certain alterations in the kitchen and adjoining offices. Deposit 1*l*. 1*s*. Mr. A. C. Williams, architect, 53 Doughty Street, W.C.

Glasgow.—May 9.—For the erection of industrial hall and offices in connection with the Scottish Exhibition, Glasgow, 1911. Deposit 5*l*. 5*s*. Messrs. Walker & Ramsay, 123 Wellington Street, Glasgow.

Glasgow.—May 14.—For the several works required in the reconstruction of public convenience at St. Vincent Place. The Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.

Glasgow.—May 19.—For the erection of a telephone exchange at Cubic Street, Bridgeton. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow.

Gosport.—May 12.—For erection of a cottage and certain gates, wall, &c., at the air-compressing station, Westfield Road. The Surveyor to the Gosport and Alverstone Urban District, Gosport.

Guildford.—May 21.—For alterations and additions to the men's block, alterations to the workshops block and to the quarters now occupied by the Master, and for erecting a new house for the Master, at the Workhouse. Send 3*l*. 3*s*. deposit by May 9 to Mr. Edward L. Lunn, architect, 36 High Street, Guildford.

Halifax.—May 10.—For the works required in pulling down and rebuilding a pair of houses at Triangle. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Halifax.—May 14.—For the execution of the following works required in erection of a police station with three cells, inspector's house, and quarters for six single constables at the junction of Burnley Road and Warley Road, King Cross, viz. :—(1) Mason's, excavator's, and bricklayer's ; (2) carpenter's and joiner's ; (3) plumber's and glazier's ; (4) slater's and plasterer's ; (5) concreter's ; (6) painter's ; (7) electricians' ; (8) steelwork ; (9) reinforced concrete and asphalte roofing ; and (10) heating. Deposits as follows, viz. :—10*l*. for No. 1, 5*l*. each Nos. 2, 3, and 9, and 1*l*. each for Nos. 4, 5, 6, 7, 8, and 10. Mr. James Lord, borough engineer, Halifax.

Heanor.—May 9.—For erection of proposed secondary school, Heanor, to accommodate 250 students. Deposit 1*l*. 1*s*. Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

Hemingfield.—May 9.—For the whole of the works required in the pulling down of the Milton Arms Hotel, Hemingfield, near Barnsley, and rebuilding the new hotel. Send 2*l*. 2*s*. deposit by May 9 to Messrs. Stubbs & Brown, architects, &c., 74 High Street, Sheffield.

Hirst.—May 21.—For the erection of twelve semi-detached houses in Woodhorn Road, for the Ashington Industrial Co-operative Society. Mr. Osborne Blyth, architect, Ashington.

Hull.—May 10.— For erection of five dwelling-houses and shops, Holderness Road. Whole tenders. Deposit 1*l*. Mr. Jas. J. Adamson, architect, Colonial Chambers, Prince's Dock Street, Hull.

Ireland.—May 17.—For erection of hay shed and lean-to cattle shed, in corrugated iron, at the farmyard at Portrane Branch Asylum, Donabate, co. Dublin. Mr. W. J. Murphy, chief clerk, Grangegorman, Dublin.

Ireland.—May 17.—For the erection of forty single cottages for labourers, and fencing forty plots to same, for the Irvinestown Rural District Council. The Clerk of the Rural District Council, Board Room, Irvinestown.

Ireland.—May 25.—For the erection of the new Devenish school, Monea. Mr. Thomas Elliott, 37 Darling Street, Enniskillen.

Loftus in Cleveland.—May 13.—For erection of a Primitive Methodist Church at Loftus in Cleveland. Mr. J. Caleb Petch, architect, Bar Chambers, Scarborough.

London.—May 12.—For decorations and repairs to the church, chapel, and lodges at Lambeth Cemetery, Blackshaw Road, Tooting, S.W. Mr. Henry Edwards, C.E., borough engineer, Lambeth Town Hall, Brixton Hill, S.W.

London.—May 24.—For the reconstruction of the convenience in Byward Street, E.C., for the Corporation. Deposit 2*l*. 2*s*. The Office of the Engineer, Guildhall, E.C.

Manchester.—May 17.—For the construction of a subway in Derby Street, Cheetham. Deposit £1 1*s*. The City Surveyor's Office, Town Hall, Manchester.

New Fryston.—May 12.—For the erection of twenty-four dwelling-houses at New Fryston, near Castleford, for the Whildale Coal Company, Ltd. Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford.

Nottingham.—May 9.—For the erection and completion of sliding shutters at the female sanatorium, Bagthorpe Workhouse. Mr. Arthur Marshall, A.R.I.B.A., architect, King Street, Nottingham.

Padiham.—May 11.—For erection of new offices, stores, and workshops on the new gas-works site. The Gas Engineer's Office, Inskip Street, Padiham.

Peterborough.—May 12.—For enlargement of Deacon's School. Send names before May 12 to Messrs. Townsend & Fordham, architects, Cross Street, Peterborough.

Petworth.—May 18.—For erection of a new post office for the Commissioners of H.M. Works and Public Buildings. Send 1*l*. 1*s*. deposit to H.M. Office of Works, Storey's Gate.

Portchester.—May 21.—For erection of two semi-detached small holdings dwelling-houses at Portchester, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Prestolee.—May 7.—For erection of an elementary school for 510 children, with accommodation for the teaching of domestic subjects and manual instruction, at Prestolee, near Bolton, Lancashire. Deposit 2*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Scotland.—May 9.—For erection of a corrugated iron building for housing the burgh plant, for the Inverurie Town Council. The Burgh Surveyor, Inverurie, Scotland.

SCOTLAND.—For the various works required in the erection of new property, Church Street, Inverkeithing, for Mr. Wm. Gilmour, baker. Mr. Alex. Robertson, architect, Inverkeithing.

SCOTLAND.—May 9.—For the mason, carpenter, slater, plasterer, plumber, painter and glazier works of additions to and alterations on Kennethmont Church. Mr. Geo. Bennett Mitchell, architect, 148 Union Street, Aberdeen.

SCOTLAND.—May 9.—For the mason, carpenter, slater, plasterer, and plumber works of proposed addition to Muirtack school, Ardallie. Mr. Wm. Davidson, architect, Ellon, N.B.

SCOTLAND.—May 16.—For brickwork, joiner, plaster, slater, plumber, and gas-fitting for three cottages to be built at Bowhill, Cardenden. Mr. David Burt, Station Road, Cardenden.

SCOTLAND.—May 17.—For erection of a spire on the U.F. English Church, Stornoway. Mr. Alexr. Macdonald, architect, Municipal Buildings, Stornoway.

SHOTTON COLLIERY.—May 10.—For erection of two farmhouses and steadings on Bracken Hill Farm, Shotton Colliery (sole tenders). The Clerk to the County Council, Shire Hall, Durham.

THORNBURY.—May 19.—For the various works (painter's excepted) required in erection of a store in Woodhall Avenue, Thornbury, Yorks. Mr. William Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

WALES.—May 7.—For erection of a warehouse, workshop, stables, &c., in Love Lane, Cardiff. Deposit 2*l.* 2*s.* Messrs. James & Morgan, FF.R.I.B.A., architects and surveyors, Charles Street Chambers, Cardiff.

WALES.—May 9.—For alterations, additions, and renovations to Tabernacle Chapel, Pontypridd. Deposit 2*l.* 2*s.* Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

WALES.—May 10.—For erection of new premises at Tylorstown, for the Ferndale Industrial Co-operative Society. Deposit 2*l.* 2*s.* Messrs. W. Morgan Lewis & T. Naunton Morgan, architects and surveyors, Pontypridd.

WALES.—May 10.—For erection of eleven pairs of semi-detached villas and thirty-four houses near Intermediate schools, Ebbw Vale, for the Blaen Ebbw Building Club. Mr. Wm. Harris, architect and surveyor, Bank Chambers, Bargoed.

WALES.—May 10.—For erection of new premises at Tylorstown, for the Ferndale Industrial Co-operative Society. Deposit 2*l.* 2*s.* Messrs. W. Morgan Lewis & T. Naunton Morgan, architects and surveyors, Pontypridd, and Tonypandy offices.

WALES.—May 10.—For erection of a masonic lodge and caretaker's house to be built at Treharris. Apply to "Bryntaf," John Street, Treharris.

WALES.—May 11.—For the rebuilding of 148 High Street, Merthyr Tydfil. Mr. C. M. Davies, M.S.A., 112 High Street, Merthyr.

WALES.—May 11.—For erection of a pair of semi-detached cottages and six other cottages in blocks of two and four on their respective sites at Golynes, Talywain. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WALES.—May 14.—For erection and completion of a pair of villas, Gwbert Road, Cardigan. Mr. J. Teifion J. Williams, architect, Napier Street, Cardigan.

WALES.—May 16.—For alterations, additions, and drainage works at Tredwgan Farm, Barry. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and surveyors, Church Street Chambers, Pontypridd.

WALES.—May 18.—For erection and completion of a new bungalow cottage, Gwbert Road, Cardigan. Mr. J. Teifion J. Williams, architect, Napier Street, Cardigan.

WALES.—May 21.—For erection of a new church at Abercanaid. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—May 21.—For stripping and reslating, &c., roofs at 62 Charles Street, Cardiff, for the Guardians. Mr. Arthur J. Harris, clerk, Union Offices, Queen's Chambers, Cardiff.

WALES.—May 21.—For taking down two old cottages and erecting three cottages at Dowlais, for the Foresters' Society. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALLASEY.—May 24.—For the erection of the Public Library, Earlston Park, Liscard. Send 1*l.* deposit by May 11 to Mr. J. Brierly Preston, surveyor, Central Buildings, 41 North John Street, Liverpool.

WATH-UPON-DEARNE.—May 20.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—Wath-upon-Dearne, Park Road Council school—new infants' department—builder, joiner, slater, plumber, plasterer, painter. Deposit 1*l.* The Education Architect, County Hall, Wakefield.

WEDNESBURY.—May 24.—For erection of the Holyhead Road Council schools. Send 2*l.* 2*s.* deposit by May 10 to Mr. C. W. D. Joynson, architect, Springhead, Wednesbury.

WHALLEY (LANCS.).—May 10.—The Lancashire Asylums Board are about to erect an asylum at Whalley, which may involve an expenditure on the first contract of about 300,000*l.* Contractors who are desirous of tendering must send in their names and addresses to the Architect, County Offices, Preston.

WHITLEY BAY (NORTHUMBERLAND).—May 17.—For provision and erection of a shelter seat in an open space on the Promenade, Whitley Bay. Mr. A. J. Rousell, A.M.I.C.E., surveyor, Council Offices, Whitley Bay.

## TENDERS.

### CANTERBURY.

For extension of the School of Art. Messrs. JENNINGS & GRAY, architects, Canterbury.

| | | | |
|---|---|---|---|
| Moss | £3,330 | 0 | 0 |
| Knock | 2,997 | 0 | 0 |
| G. Denne | 2,832 | 0 | 0 |
| Wallis | 2,794 | 0 | 0 |
| T. Denne | 2,720 | 0 | 0 |
| Godden | 2,700 | 0 | 0 |
| Edwards | 2,675 | 10 | 0 |
| Foster | 2,627 | 0 | 0 |
| Bowles | 2,605 | 0 | 0 |
| Browning | 2,585 | 0 | 0 |
| MOUNT, Canterbury (*accepted*) | 2,453 | 0 | 0 |

### COVENTRY.

For new laboratory and testing-house at Edgwick Works. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

| | | | |
|---|---|---|---|
| Elliott | £570 | 0 | 0 |
| Garlick's Exors. | 570 | 0 | 0 |
| Hancox & Co. | 570 | 0 | 0 |
| Wellerman Bros. | 569 | 5 | 0 |
| Higgins | 537 | 0 | 0 |
| Jones & Bacon | 532 | 17 | 0 |
| RANDLE, Coventry (*accepted*) | 525 | 0 | 0 |

### EARSWICK.

For erecting a warehouse and workshops at Earswick, near York. Mr. A. D. CREER, architect, York.

| | | | |
|---|---|---|---|
| Shepherd | £2,400 | 0 | 0 |
| Tinson | 2,267 | 10 | 0 |
| Pulleyn | 2,190 | 18 | 2 |
| Wray & Sons | 2,039 | 19 | 4 |
| Usher | 1,961 | 11 | 0 |
| BIRCH, York (*accepted*) | 1,942 | 10 | 8 |

### EDENBRIDGE.

For erection of a Council school to accommodate 200 children at Edenbridge, Kent. Mr. W. H. ROBINSON, M.S.A., architect.

| | | | |
|---|---|---|---|
| Sykes & Son | £3,860 | 0 | 0 |
| Longley & Co. | 3,389 | 0 | 0 |
| Packer & Sons | 3,257 | 0 | 0 |
| H. & E. Waters | 3,387 | 0 | 0 |
| Wade & Sons | 3,238 | 0 | 0 |
| Bingham | 3,211 | 6 | 5 |
| Gorham | 3,209 | 0 | 7 |
| Smith & Sons | 3,169 | 0 | 0 |
| Battley, Sons & Holness | 3,161 | 0 | 0 |
| F. & G. Foster | 3,157 | 0 | 0 |
| Perton & Co. | 3,150 | 0 | 0 |
| Wallis & Sons | 3,123 | 0 | 0 |
| Lowe & Co. | 3,077 | 0 | 0 |
| Davison | 3,049 | 0 | 0 |
| G. & F. Penn | 3,038 | 0 | 0 |
| Browning | 2,984 | 0 | 0 |
| Martin & Co. | 2,979 | 0 | 0 |
| Archer & Son | 2,950 | 0 | 0 |
| Skinner | 2,884 | 0 | 0 |
| Cook & Sons | 2,874 | 0 | 0 |
| Podger & Son | 2,843 | 0 | 0 |
| Wise | 2,825 | 0 | 0 |
| Gathercole Bros. | 2,822 | 0 | 0 |
| Ballard | 2,811 | 0 | 0 |
| GODDEN & SONS, Ashford (*accepted*) | 2,634 | 0 | 0 |

## EASTBOURNE.

For alterations and additions to the entrance lodge at Oaklynge Cemetery. Mr. **Montague Wood**, architect, Eastbourne.

| | | | |
|---|---|---|---|
| Miller & Selmes | £640 | 0 | 0 |
| Hookhan | 614 | 0 | 0 |
| Peerless, Dennis & Co. | 538 | 0 | 0 |
| King & Son | 530 | 0 | 0 |
| Allcock | 480 | 0 | 0 |
| Marchant | 480 | 0 | 0 |
| **Thompson**, Eastbourne (*accepted*) | 479 | 0 | 0 |

## FINCHLEY.

For new cookery and manual training centres, and extension of the sanitary offices at the Finchley County school, for the Middlesex County Council. Mr. H. G. **Crothall**, architect to the education committee.

| | | | |
|---|---|---|---|
| Treasure & Son | £1.974 | 0 | 0 |
| Batchelor & Sons | 1.950 | 0 | 0 |
| Neal | 1.943 | 0 | 0 |
| Gibson & Co. | 1.934 | 0 | 0 |
| Knight & Son | 1.795 | 0 | 0 |
| Lawrence & Son | 1.758 | 0 | 0 |
| Mattock Bros. | 1.727 | 0 | 0 |
| Monk | 1.727 | 0 | 0 |
| Lawrance & Sons | 1.692 | 0 | 0 |
| Stewart (*recommended*) | 1.648 | 0 | 0 |

## LEICESTER.

For extensions to the Museum and Art Gallery Buildings. Messrs. **Tait & Herbert**, architects, Leicester and Coventry.

| | | | |
|---|---|---|---|
| Elliott | £7.648 | 0 | 0 |
| Bowies & Son | 7.346 | 0 | 0 |
| Fox | 7.300 | 0 | 0 |
| Sharp | 7.190 | 0 | 0 |
| Kellett & Son | 7.150 | 0 | 0 |
| Hutchinson & Son | 7.126 | 0 | 0 |
| Bentley & Co. | 7.098 | 0 | 0 |
| Clark & Garrett | 7.055 | 0 | 0 |
| Herbert & Sons | 7.035 | 0 | 0 |
| A. & W. Chambers | 7,024 | 15 | 0 |
| **Chapman**, Leicester (*accepted*) | 6.901 | 0 | 0 |
| Bradford | 6,726 | 7 | 0 |

## LONDON.

For alterations and additions at the underground convenience in front of the Royal Exchange, for the Corporation.

| | | | |
|---|---|---|---|
| H. & E. Lea | £5.900 | 0 | 0 |
| Kavanagh & Co. | 5.390 | 0 | 0 |
| Fry & Co. | 5.304 | 0 | 0 |
| Wagstaff & Sons | 5,258 | 0 | 0 |
| Hyde & Co. | 5.112 | 0 | 0 |
| Jarman & Co. | 5.098 | 0 | 0 |
| Jennings | 5.070 | 0 | 0 |
| Doulton & Co. | 5,062 | 0 | 0 |
| Adamsez | 4,991 | 0 | 0 |
| McCormick & Sons | 4,990 | 0 | 0 |
| Shurmur & Sons | 4.986 | 0 | 0 |
| Roberts & Co. | 4,784 | 0 | 0 |
| Davis, Bennett & Co. | 4,724 | 0 | 0 |
| **Greenwood** (*accepted*) | 4.471 | 15 | 0 |
| Estimated cost | 5,000 | 0 | 0 |

## LOUGHTON.

For erection of a Council school for girls at Loughton, Essex. Mr. H. **Tooley**, F.R.I.B.A., architect, Buckhurst Hill, Essex.

| | | | |
|---|---|---|---|
| Ballard | £4.700 | 0 | 0 |
| Woollaston & Co. | 4.360 | 0 | 0 |
| Battley, Sons & Holness | 4,269 | 0 | 0 |
| Warriner | 4.245 | 0 | 0 |
| Myall & Upson | 4.206 | 0 | 0 |
| Parker & Sons | 4.199 | 0 | 0 |
| F. & G. Foster | 4,196 | 0 | 0 |
| Ekins & Co. | 4.180 | 0 | 0 |
| Nightingale | 4.160 | 0 | 0 |
| Fryd | 4.157 | 0 | 0 |
| Hawkey & Oldman | 4.145 | 0 | 0 |
| Symes | 4.030 | 0 | 0 |
| Cook & Sons | 3.969 | 0 | 0 |
| Monk | 3.935 | 0 | 0 |
| Paul | 3.898 | 0 | 0 |
| Foster & Son | 3.746 | 0 | 0 |
| Hammond & Son | 3.725 | 0 | 0 |
| **Clark & Sons**, Cambridge (*accepted*) | 3.597 | 10 | 0 |

## PORTSMOUTH.

For the erection of a temporary corrugated iron building in the playground of the Stamshaw boys' school. Mr. A. H. **Bone**, surveyor, Portsmouth.

| | | | |
|---|---|---|---|
| Davis | £1,997 | 0 | 0 |
| Walker | 1,933 | 0 | 0 |
| Peirson & Co. | 1,926 | 0 | 0 |
| Blakeley & Co. | 1,919 | 10 | 0 |
| Priest & Son | 1,914 | 2 | 3 |
| McManus | 1,880 | 0 | 0 |
| Harrison & Co. | 1,844 | 4 | 3 |
| Mundy | 1,839 | 14 | 0 |
| Ginger, Lee & Co. | 1,798 | 0 | 0 |
| Hawkins | 1,790 | 0 | 0 |
| Pryer & Son | 1,756 | 0 | 0 |
| Wire-Wove Roofing Co. | 1,695 | 0 | 0 |
| Tanner | 1,690 | 0 | 0 |
| Salter | 1,673 | 0 | 0 |
| Harbrow | 1,672 | 0 | 0 |
| Crockerell | 1.648 | 0 | 0 |
| **Privett**, Portsmouth (*accepted*) | 1.639 | 0 | 0 |
| Woods & Co. | 1,634 | 16 | 2 |

## SOUTHEND-ON-SEA.

For erection of a new infants' department, Chalkwell Hall Council school. Mr. W. J. **Wood**, architect, Southend-on-Sea.

| | | | |
|---|---|---|---|
| Grainger | £5.000 | 0 | 0 |
| Woodhams | 4,790 | 0 | 0 |
| Whur | 4,755 | 0 | 0 |
| Green | 4.700 | 16 | 0 |
| Flaxman | 4,695 | 0 | 0 |
| Milton | 4,672 | 3 | 3 |
| Kirk & Kirk | 4.630 | 0 | 0 |
| Ballard | 4.488 | 0 | 0 |
| E. & B. H. Davey | 4,486 | 0 | 0 |
| F. & E. Davey | 4.436 | 0 | 0 |
| Pavitt & Sons | 4.370 | 0 | 0 |
| F. & A. Willmott | 4.302 | 0 | 0 |
| Moss | 4,271 | 9 | 0 |
| Hammond & Son | 4,244 | 0 | 0 |
| Burtwell | 4.178 | 0 | 0 |
| **Fryd** (*accepted*) | 4,115 | 0 | 0 |

## WALES.

For erecting an infants' school with offices, &c., at Clarence Street, Mountain Ash. Mr. W. H. **Williams**, architect, Mountain Ash.

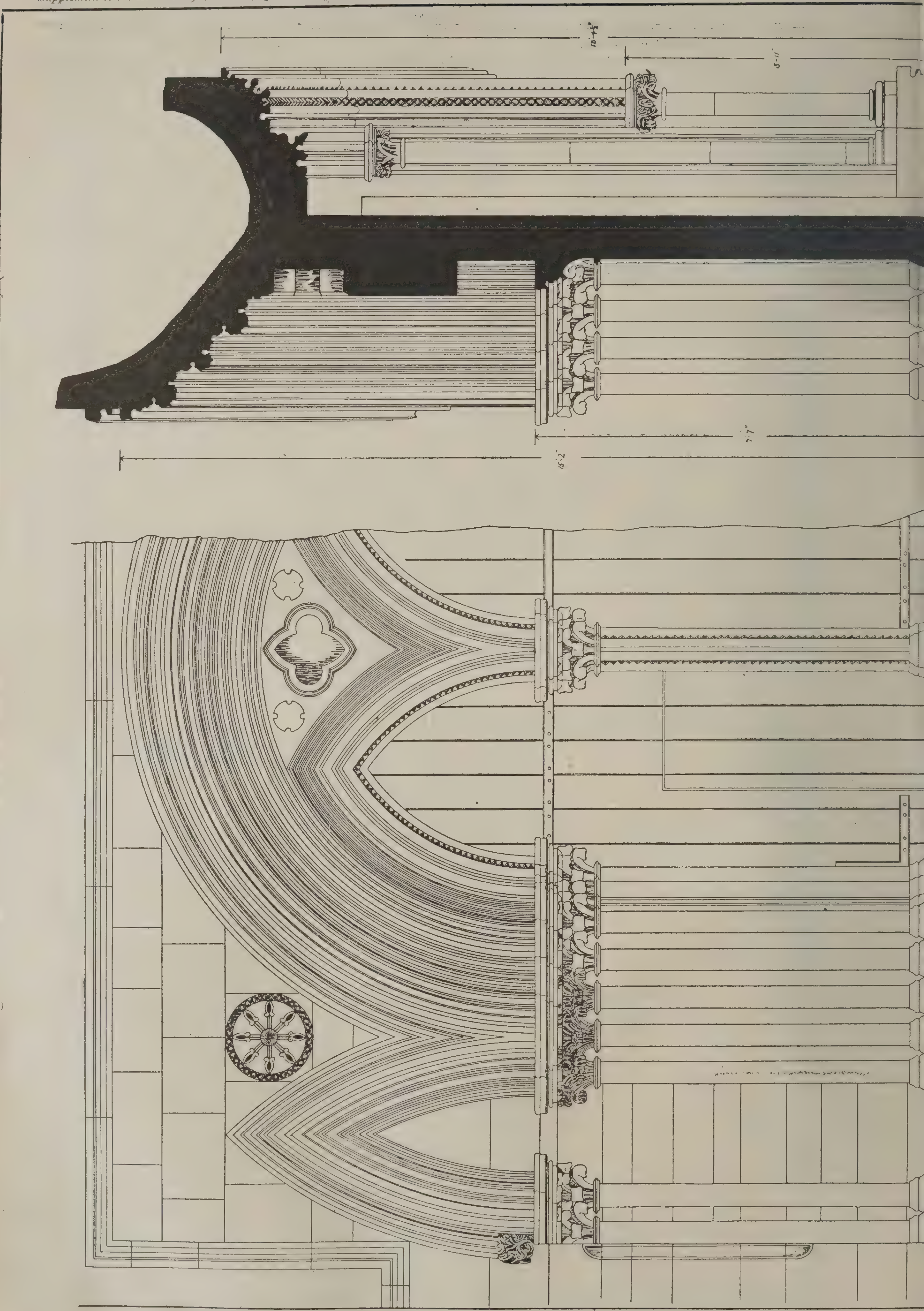
| | | | |
|---|---|---|---|
| Howells | £4.230 | 0 | 0 |
| Jenkins & Sons | 4,065 | 0 | 0 |
| D. Davies & Sons | 4,024 | 0 | 0 |
| Lewis | 3,850 | 0 | 0 |
| John | 3,770 | 10 | 0 |
| Jones Bros. | 3.770 | 0 | 0 |
| Evans | 3.763 | 0 | 0 |
| Shail | 3,668 | 0 | 0 |
| R. Jones | 3,663 | 0 | 0 |
| T. W. **Davies**, Cardiff (*accepted*) | 3,500 | 0 | 0 |

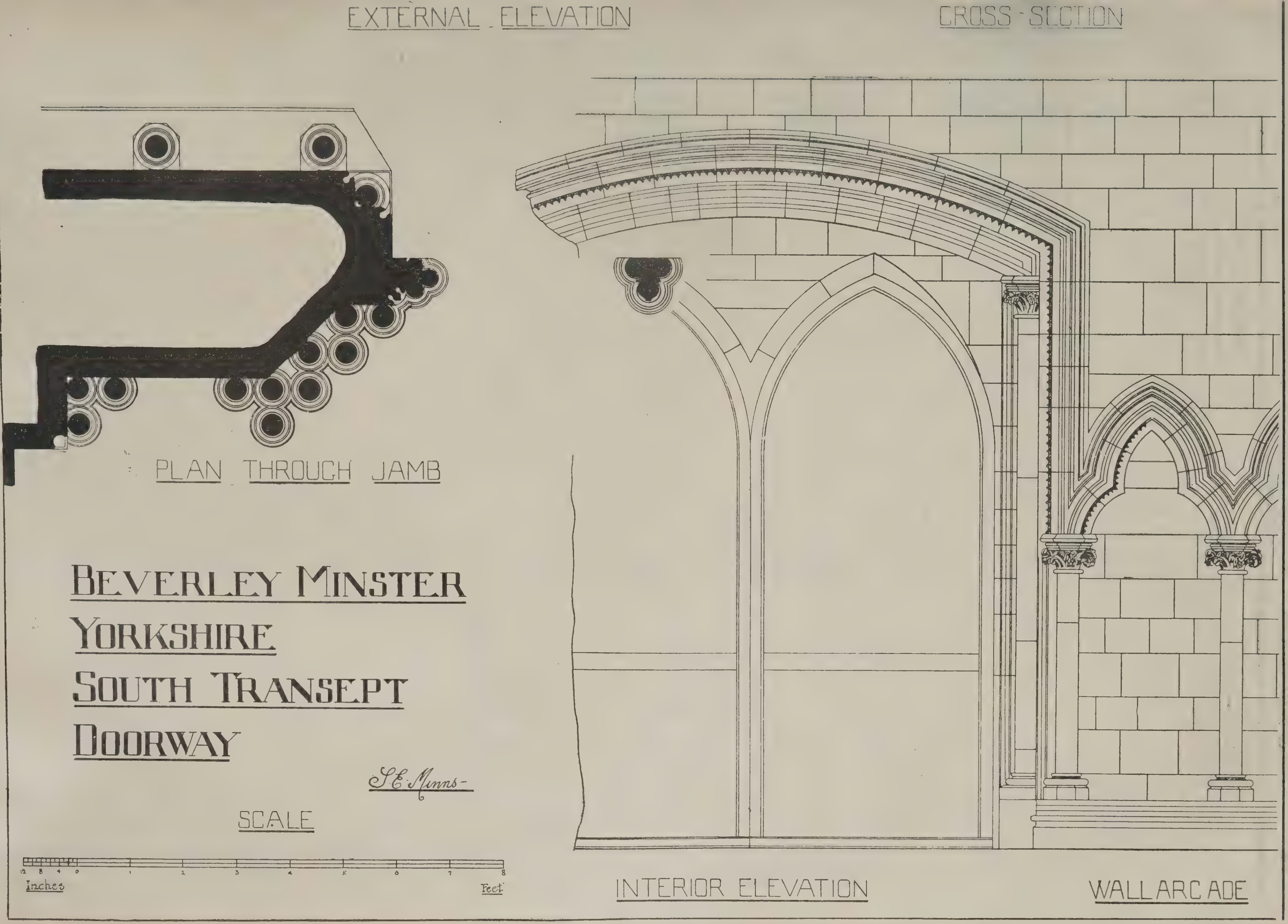
For erection of a police-station at Bedwas, Mon. Mr. **William Tanner**, county surveyor, Newport.

| | | | |
|---|---|---|---|
| Beames | £2,259 | 7 | 0 |
| James | 2,021 | 0 | 0 |
| Blundell & Bevan | 2,000 | 0 | 0 |
| Davies & Son | 2,000 | 0 | 0 |
| Gibby & Cleak | 1,969 | 0 | 0 |
| Morgan & Co. | 1,869 | 0 | 0 |
| Leadbeter & Co. | 1,861 | 0 | 0 |
| Hamilton & Millard | 1,850 | 0 | 0 |
| Moon | 1,847 | 0 | 0 |
| Williams Bros. | 1,843 | 3 | 7 |
| Reed | 1,840 | 0 | 0 |
| Charles | 1,835 | 0 | 0 |
| Sainsbury | 1,834 | 0 | 0 |
| Howell | 1,800 | 0 | 0 |
| Brownscombe & Son | 1,795 | 0 | 0 |
| Harding | 1,795 | 0 | 0 |
| Jenkins | 1,782 | 0 | 0 |
| Williams | 1,757 | 0 | 0 |
| Prosser | 1.697 | 0 | 0 |
| G. F. Leadbeter | 1.658 | 0 | 0 |
| Hancock | 1.615 | 13 | 2 |
| **King & Co.**, Newport (*accepted*) | 1.584 | 0 | 0 |

(*Continued on page 14.*)

# “THE ARCHITECT” STUDENTS’ SKETCHING AND MEASURING CLUB.





# BEVERLEY MINSTER
# YORKSHIRE
# SOUTH TRANSEPT
# DOORWAY

S. E. Minns-

(*Continued from page* 11.)

### WALES—*continued.*

For erecting a proposed workmen's library and institute, Windsor Collieries, Abertridwr. Mr. Illtyd Thomas, F.S.I., Cardiff.

| | | | |
|---|---|---|---|
| Howells | £7,100 | 0 | 0 |
| W. Williams | 6,999 | 0 | 0 |
| Blundell & Bevan | 6,958 | 0 | 0 |
| Jenkins & Son | 6,850 | 0 | 0 |
| Hamilton & Millard | 6,845 | 0 | 0 |
| Jones | 6,836 | 5 | 1 |
| T. F. Howells | 6,830 | 0 | 0 |
| Morgan | 6,800 | 0 | 0 |
| Bristow | 6,780 | 0 | 0 |
| Evans Bros. | 6,749 | 0 | 0 |
| Thomas & Co. | 6,719 | 4 | 4 |
| Colborne | 6,679 | 0 | 0 |
| D. Davies & Sons | 6,654 | 0 | 0 |
| D. W. Davies and Howell | 6,496 | 0 | 0 |
| Knox & Wells | 6,485 | 0 | 0 |
| Bond | 6,298 | 0 | 0 |
| Davies & Lloyd | 6,199 | 0 | 0 |
| Lewis | 6,100 | 0 | 0 |
| J. Williams, Abertridwr (*accepted*) | 6,080 | 0 | 0 |

For erection of an infants' school, with offices, &c., at Clarence Street, Mountain Ash. Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

| | | | |
|---|---|---|---|
| Howells | £4,230 | 0 | 0 |
| Jenkins & Sons | 4,065 | 0 | 0 |
| D. Davies & Sons | 4,024 | 0 | 0 |
| Lewis | 3,850 | 0 | 0 |
| John | 3,770 | 0 | 0 |
| Jones Bros. | 3,770 | 0 | 0 |
| Evans | 3,763 | 0 | 0 |
| Shail | 3,668 | 0 | 0 |
| Jones | 3,663 | 0 | 0 |
| T. W. Davies, Cardiff (*accepted*) | 3,500 | 0 | 0 |

### WALSOKEN.

For work at new school, Walsoken, Norfolk. Mr. H. J. Green, architect and diocesan surveyor, Norwich.

| | | | |
|---|---|---|---|
| F. & C. Dickerson | £2,957 | 0 | 6 |
| Collins | 2,898 | 7 | 6 |
| Cracknell | 2,792 | 0 | 0 |
| Ashby | 2,774 | 0 | 0 |
| Hall & Lawson | 2,555 | 11 | 0 |
| Youngs & Son | 2,540 | 0 | 0 |
| Rands & Son | 2,434 | 0 | 0 |
| Shanks | 2,393 | 16 | 8 |
| Wilkinson | 2,392 | 4 | 4 |
| Sutton & Sons, Upwell (*accepted conditionally*) | 2,290 | 17 | 11 |

### WAMBROOK.

For alterations and additions to Wambrook schools, near Chard. Messrs. Symes & Madge, architects and surveyors, Chard.

| | | | |
|---|---|---|---|
| Fursland | £547 | 0 | 0 |
| Spiller | 449 | 10 | 0 |
| Layzell | 445 | 10 | 0 |
| Parsons Bros. & Dunster | 429 | 0 | 0 |
| Strawbridge | 425 | 0 | 0 |
| Harris | 414 | 0 | 0 |
| Bryer, jun. | 410 | 0 | 0 |
| Relleen & Griffiths | 398 | 0 | 0 |
| Collins, Wambrook (*accepted*) | 389 | 13 | 4 |

### WEYBRIDGE.

For the alteration and renovation of the stables at the rear of the Council offices.

| | | | |
|---|---|---|---|
| Willis | £330 | 0 | 0 |
| Underwood | 328 | 0 | 0 |
| Greenfield | 315 | 0 | 0 |
| Nicholson | 314 | 0 | 0 |
| Horsell | 289 | 0 | 0 |
| Curtis | 287 | 0 | 0 |
| Brown (*accepted*) | 255 | 0 | 0 |

### WORTHING.

For erection of cookery and manual instruction centre, Richmond Road. Borough Surveyor.

| | | | |
|---|---|---|---|
| Longley & Co. | £1,588 | 0 | 0 |
| Bostel Bros. | 1,552 | 0 | 0 |
| Apted, Greenfield & Co. | 1,545 | 0 | 0 |
| Linfield & Sons | 1,532 | 0 | 0 |
| Moat | 1,530 | 0 | 0 |
| Sandell | 1,400 | 0 | 0 |
| Cook & Sons | 1,385 | 0 | 0 |
| Sandell & Sons, Worthing (*recommended*) | 1,340 | 0 | 0 |

## CORRESPONDENCE.

### Waterproof Building.

Sir,—With reference to the article "Waterproof Building" which appeared in your issue of the 22nd ult., we beg to say that it has caused us great inconvenience that Ceresit should be confounded with Medusa and Solita. We must point out to you that Ceresit is not a powder, and that is one of the principal advantages of our material. As you will no doubt appreciate, the mixing of powders in exact proportions is very difficult to do, the result being that the waterproofing material is unevenly distributed throughout the mass. Our material Ceresit takes the form of a paste about the consistency of butter, which is diluted with water in the proportions of one part Ceresit to ten parts water, resulting in a milky fluid. This mixture is then poured direct to the cement mortar in place of the ordinary diluting water. Thus you insure absolutely the waterproofing quality of the entire mass.

We should be glad if you would kindly rectify this mistake through the medium of your journal at your very earliest convenience, and oblige,

The British Ceresit Waterproofing Co., Ltd.
London, S.W.: May 4, 1910.

## COMPETITION.

Liverpool.—The Corporation recently invited architects practising in Liverpool to submit designs for the Walton and Fazakerley Free Library, to be erected at a cost of not more than 7,000*l*. Mr. W. E. Willink, F.R.I.B.A., the assessor, has published his award. The three selected designs were as follows:—(1) Messrs. Briggs, Wolstenholme & Thornley; (2) Mr. R. Wynn Owen, A.R.I.B.A.; and (3) Mr. T. Taliesin Rees, F.R.I.B.A., and Mr. F. B. Hobbs, A.R.I.B.A.

## TRADE NOTES.

A large clock has just been erected in the tower of St. Luke's Hospital, Halifax, by John Smith & Sons, Midland Clock Works, Derby. It is fitted with all the latest improvements, and made generally to the designs of the late Lord Grimthorpe. The same firm have recently erected large clocks in the same neighbourhood at Elland Town Hall, Sowerby Church, and West Vale Church.

The Easton Lift Company, Ltd., inform us that owing to the increase of business they have been compelled to obtain larger premises in London. They have therefore vacated the workshops at College Street, Lambeth, together with the offices at Broad Sanctuary Chambers, Westminster; and the address of their head office, where all communications should be sent, is now "Express" Works, Short Street, Southwark, S.E. (five minutes from Waterloo Station). The new premises afford increased facilities for quick delivery generally, and for prompt attention to repair work.

The British Stone and Marble Co., Ltd., announce that an interesting exhibition of their material and products will shortly be held at Caxton House, Westminster, S.W., to which architects, surveyors, builders and contractors are especially invited. Their stone is a true stone, homogeneous throughout, and made from best quarry débris on the basis of the processes of nature.

The Welsh slate trade continues to improve, and following on the resumption of full time at the quarries in Festiniog after three years of work at four days a week comes an announcement of an increase in wages in other Festiniog quarries.

The Matlock Urban Council have appointed a subcommittee to organise a competition for obtaining designs for a pavilion to be erected on the Hall Leys estate, which will be developed as a pleasure ground.

A White Paper shows that under the Appropriation Acts, 1907, 1908, and 1909, the Board of Education, up to March 31 of the present year, had paid 20,850*l*. in England, and 32,520*l*. 16*s*. 6*d*. in Wales, in respect of special grants for the building of new public elementary schools.

Messrs. Liddle & Brown, architects, Newcastle-on-Tyne, were on Tuesday instructed by the Wallsend Town Council to prepare plans and estimates for a swimming bath 100 feet long and twelve slipper baths, to be erected behind the municipal buildings.

The estates and finance committee of the Dublin Corporation strongly recommend that immediate steps be taken for the erection of the proposed additional municipal offices on land already purchased in Lord Edward Street. The city architect estimates that the cost of the work will be 50,000*l*.

## KELLY'S BUILDING TRADES DIRECTORY, 1911.

The appearance of the eleventh edition of Kelly's Directory of the Building Trades is no small event. The preceding edition was issued in 1906; and in the interval there have been such ceaseless changes that a revised edition was becoming more and more desirable.

The book contains 2,530 pages (exclusive of indices), and about 300,000 classifications. It is designed to give complete lists of all the various professions, trades, and businesses connected with the constructive arts, and the aim of the publishers has been to make each new edition more complete and accurate than the preceding one. No distinctions are made in the Directory; a small town, if a builder carries on business in it, finds its place in it equally with the large provincial city or the metropolis itself. The work is as reliable as it is possible to make a book of so large and comprehensive a character. It contains: (1) Lists of the metropolitan, county and borough surveyors; (2) every ascertainable name (inclusive of architects) in the towns and villages alphabetically arranged under each county in England, Scotland and Wales, and under each trade; (3) the names under each particular trade in London and its suburbs, alphabetically arranged; (4) the names for the rest of England, Scotland and Wales similarly arranged; (5) the names for Ireland arranged under towns and trades; and (6) the names for the Channel Islands and Isle of Man, also arranged under towns.

The whole of the names given in the Directory have been personally checked by canvassers, and their returns afterwards arranged by a staff of specially trained clerks. Messrs. Kelly can claim an enormous amount of experience in this class of work, and it is safe to say that their present edition is as complete as it could be made under existing conditions. It is just over forty years since the first Building Trades Directory was brought out, and by now "Kelly's" has become indispensable.

## VARIETIES.

Duns School Board have adopted proposals for the enlargement of the Berwickshire High School, Duns. It has been resolved to instruct a firm of Glasgow architects to prepare final plans for the extension and specifications in terms of the Scotch Education Department's requirements. The probable estimate of the cost is 5,530*l.*

A fund is to be raised for a memorial to the late Dr. King, Bishop of Lincoln. The scheme approved will embrace two memorials, the first a statute or recumbent figure of the late prelate, to be placed in Lincoln Cathedral, and the second the completion of the fund for building the Memorial Church of St. Luke in Grimsby.

The Westminster City Council have, it is announced, determined to light Victoria Street, Regent Street, Piccadilly Circus, St. James's Street, and Pall Mall by high-pressure gas lamps with mantles instead of by electricity. The tenders of the gas companies and the electricity companies, it is said, showed a difference of between 30 and 80 per cent. in favour of gas.

The West Riding education committee have decided that in view of colliery developments a new elementary school be provided in the township of Balby. It is estimated to cost 8,400*l.*, and will make provision for 700 pupils. They have also accepted tenders of 4,471*l.* for the Loxley new school, Bradfield, and of 6,963*l.* for the Horsforth new school.

The plans for the pavilion to be erected on the Low Green, Ayr, by the Corporation have been passed at the Dean of Guild Court. The building is to cost 6,000*l.* It will be built of brick and rough-cast, and will have accommodation in the auditorium and galleries for about 2,500, while there will be tea rooms and other accommodation. The architect is Mr. J. K. Hunter, Ayr.

The Ecclesiastical Commissioners have notified the Bishop of Liverpool that they will accept the Lady chapel when consecrated as the cathedral church of Liverpool for the time being. This means that the chapel will for all purposes have the full status and dignity of a cathedral, in which full cathedral services, ordinations, and other functions of the Church may be held. There was some legal doubt at first whether the Lady chapel could be so used.

At the monthly meeting of the Barrow Town Council, the gas and water committee reported that terms have been agreed to between the Corporation and Messrs. Wm. Kennedy, Ltd., in the dispute with respect to their contract for the construction of the embankment at Seathwaite Tarn and the intake in the River Duddon. The contractors claimed 31,264*l.* as balance owing to them, and they have accepted 11,000*l.*

Messrs. Morrison & Mason, contractors and builders, Polmadie, Glasgow, have secured the contract for the construction of the new Government graving dock at Portsmouth. The dock is to be large enough to accommodate the largest *Dreadnought*, and it is expected that the work of construction will occupy from three to four years. The contract price is about 1¼ million sterling.

The Argyllshire county authorities have under consideration a proposal to construct a road from Ballachulish to Kinlochleven, where the works of the British Aluminium Company are located, and where there is a population of over 4,000. If proceeded with the new road will not only serve Kinlochleven but will form a new route through Scotland, opening up to motorists a region along the west coast now closed. The estimated cost is 16,000*l.* Two routes have already been surveyed.

Messrs. Sheppard & Lockton, architects, Newark, have prepared plans for the St. Leonards (Newark) Charity Trustees, who have decided to utilise some of their surplus funds for the erection of twelve cottage homes for aged and worthy poor. A nominal rent to avoid the taint of charity will be charged the tenants, and the accommodation provided will comprise a living room, bedroom, pantry, and usual out-offices.

The Manchester Society of Architects held their annual general meeting on April 27, when the officers, Council, and committees for the ensuing year were elected. Mr. P. S. Worthington, M.A., F.R.I.B.A., was re-elected as president, for a second year; Messrs. Edgar Wood, A.R.I.B.A., and John Brooke, F.R.I.B.A., are vice-presidents; and Mr. Isaac Taylor, F.R.I.B.A., hon. secretary.

Messrs. Holcombe, Betts & West will sell by auction on May 24 at the Mart, Tokenhouse Yard, E.C., an important freehold estate in Kilburn, known as "The Grange." The estate comprises about 9½ acres, it has an extensive frontage of 330 feet to the High Road, Kilburn, 413 feet to Messina Avenue, and 106 feet to Hemstall Road. It is within four miles of Charing Cross and stands in a prosperous neighbourhood. The auctioneers will also offer three freehold shops, known as Nos. 260, 262 and 264 High Road, Kilburn.

Edinburgh Dean of Guild Court last week granted a warrant to the First Church of Christ Scientist to erect a church at Inverleith Terrace. The church will be of stone, and will accommodate 630 people. Underneath there will be a hall to hold 180, and on the same level there will be accommodation for libraries, reading-rooms, and schoolrooms. A large tower will be placed at the entrance end with two flanking staircase turrets. Mr. Ramsay Traquair is the architect.

The Bacup education committee have accepted the scheme of the County Education Department for a new elementary science school in the district, to serve as a preparatory school to a big secondary school which is being built by the Corporations of Bacup and Rawtenstall at Waterfoot. It is recommended that the county architect should prepare plans for a building containing a lecture-room, a laboratory (with the necessary store-rooms), cookery and laundry departments, and class-rooms.

"The Pictures of 1910" again appears in its familiar light brown colour; and the *Pall Mall Magazine* publishers have provided once more a delightful picture-book, which gives a very excellent idea of the more prominent examples of painting and sculpture to be seen at the Royal Academy. The selection has, as usual, been done very wisely, and the reproductions are for the most part excellent. This shilling annual may be heartily recommended to anyone who cannot "do" the Academy at all, or who is curious to get a general idea at once as to its contents, or to those who have been, but who retain only a blurred impression as to what was to be seen.

The Council of the Institution of Civil Engineers have made the following awards for papers during the session 1909-10:—A Telford gold medal to Mr. C. M. Jacobs (New York); a Watt gold medal to Mr. J. D. Watson (Birmingham); a George Stephenson gold medal to Mr. D. A. Matheson (Glasgow); Telford Premiums to Messrs. F. C. Buscarlet (Sunderland), A. Hunter (Glasgow), I. C. Barling (Tynemouth), J. Dalziel and J. Sayers (Derby), and J. Shaw (Birkenhead); and the Manby Premium to the late Mr. C. W. Hodson (London). The thanks of the Council have been conveyed to their colleague, Dr. C. A. Harrison, for the paper contributed by him. The awards for papers published in the proceedings without discussion and for students' papers will be announced later.

THE organisers of the second Municipal and Health Exhibition which opens at the Royal Agricultural Hall, London, on May 7, promise several novel and interesting features for this year. One of the most prominent will be a model municipal cottage. This cottage, the construction of which was only begun on Saturday last, and will be completed by the opening day, will be found to be an excellent example of what a model cottage should be. Another feature will be a specially built roadway some 300 feet long and 16 feet wide, demonstrating the various methods of road making now extant. A number of firms have arranged to lay various sections so as to afford an opportunity of comparing the different materials and methods used in dustless roadmaking. The trade exhibits are representative, and are too numerous to be mentioned here in detail, but every requirement for municipal enterprise will be found in the big hall at Islington. The Exhibition closes on May 14.

THE Council of the London Master Builders' Association met on April 21, when the president (Mr. Leonard Horner) occupied the chair. The organisation committee, of which Mr. F. Higgs was reappointed chairman, reported that the canvassing among builders and contractors, who are not members of the Association, was meeting with success, and several firms have joined. The committee also suggested a standard to be observed in accepting associate members, and the suggestion was adopted by the Council. Some cases were reported of estimates being called for for large works without quantities being supplied, together with one instance where the bills of quantities had to accompany the tender. The objections of the Association to such proceedings were forwarded to the architect in each case with satisfactory results. In response to a request from the Board of Trade, Mr. Wm. Shepherd, Mr. F. G. Rice, and Mr. Walter Lawrence, junr., were nominated to represent this Association on the advisory committee for London about to be formed in connection with the Labour Exchanges.

AT the last meeting of the Midleton Rural Council, Ireland, a curious crux arose in connection with the scheme for the erection of labourers' cottages in the Union. The usual advertisements for the erection of twenty-seven cottages in different parts of East Cork were inserted in the newspapers, but not one tender was received. It is considered that the cause might be that the amount allowed for the building of the cottages was insufficient. The amount specified for each cottage would be 170*l*., and that sum includes the building of the cottage, the cost of the plot of ground, the expense of fencing, and the incidental expenses. The building of the cottage in each case would be about 130*l*. After considerable discussion, the following resolution was adopted unanimously:—"That we, the Midleton Rural Council, having failed in our effort to get tenders from builders for the erection of labourers' cottages in Midleton Union—in fact, no tender has been sent in, although we advertised for contractors—the Council request the Local Government Board to inform them how they may now proceed with the building of the cottages, the opinion of the Council being that contractors will not be got to build them at the estimated sum of 130*l*."

AT the annual general meeting of the Institution of Civil Engineers, held on April 26, the result of the ballot for the election of officers was declared as follows:—President, Mr. Alexander Siemens; Vice-Presidents, Dr. W. C. Unwin, Mr. R. Elliott-Cooper, Mr. Anthony G. Lyster, and Mr. Cuthbert A. Brereton; other members of Council, Mr. John A. F. Aspinall (Liverpool), Mr. B. Hall Blyth (Edinburgh), Mr. John A. Brodie (Liverpool), Mr. William B. Bryan, Colonel R. E. B. Crompton, C.B., Mr. Wm. Davidson (Australasia), Mr. E. B. Ellington, Mr. Maurice Fitzmaurice, C.M.G., Mr. J. P. Griffith (Ireland), Sir Robert A. Hadfield (Sheffield), Dr. Charles A. Harrison (Newcastle-on-Tyne), Mr. Walter Hunter, Mr. G. R. Jebb (Birmingham), Mr. Harry E. Jones, Sir Wm. Thomas Lewis, Bart., K.C.V.O. (Aberdare), Mr. Hugh D. Lumsden (Canada), Sir Thomas Matthews, Hon. Charles A. Parsons, C.B. (Wylam-on-Tyne), Mr. Alexander Ross, Mr. J. W. Shores, C.M.G. (South Africa), Mr. Francis J. E. Spring, C.I.E. (India), Mr. John Strain (Glasgow), Sir Frederick R. Upcott, K.C.V.O., C.S.I., Sir Philip Watts, K.C.B., Mr. W. B. Worthington (Derby), and Mr. A. F. Yarrow (Glasgow). This Council will take office on the first Tuesday in November 1910.

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WHITSUNTIDE ON THE CONTINENT.—Return tickets at reduced fares, available for fourteen days, will be issued to Brussels for the International Exhibition, *via* Harwich and Antwerp. Passengers leaving London in the evening reach Brussels next morning after a comfortable night's rest on board the steamer. In connection with the Oberammergau Passion Play, the first representation of which takes place on the 16th inst. and the last on September 25, the Great Eastern Railway Company has arranged to supply inexpensive return tickets and to register baggage to Oberammergau, also to Garmisch Partenkirchen. Passengers can travel either *via* the Hook of Holland and Munich or *via* Antwerp and Munich. For visiting Holland special facilities are offered by the British Royal Mail Harwich-Hook of Holland route. From the Hook of Holland through carriages and restaurant cars are run to The Hague and Amsterdam, in the North and South German express trains to Cologne, Bale, and Berlin, reaching The Hague and Amsterdam early next morning, Cologne at noon, Bale and Berlin in the evening. The Danish Royal Mail steamers of the Forenede Line of Copenhagen will leave Harwich for Esbjerg (on the west coast of Denmark) on Friday, May 13, and Saturday, May 14, returning Tuesday, May 17, and Wednesday, May 18. The Swedish Royal Mail steamers will leave Harwich for Gothenburg on Saturday, May 14, returning from Gothenburg on Saturday, May 21.

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To obtain the greatest benefit from your holidays there is no doubt that a change of air is most essential. The country is now looking its best, and the various facilities for comfortable and expeditious travel should be a further inducement to spend the Whitsun recess away from home. We have a copy of the A.B.C. programme issued by the Great Central Railway Company. There are over 300 seaside and inland health resorts in the Midlands and the North, including Liverpool, Isle of Man, and West Coast, Cleethorpes, Scarborough, and East Coast, which can be reached in quick time at very low fares, and the choice of destination stretches from the Midland Counties to the far North of Scotland. To those not willing to go so far away, the Vale of Aylesbury, Chiltern Hills, and Stratford-onAvon should particularly appeal. Shakespeare's country is quite an earthly paradise, and the poet's associations with Stratford are so intensely interesting that no Englishman can afford to miss them. Those wishing to undertake a walking or cycling tour, visiting the beauty spots of Middlesex, Herts, and Beechy Bucks are given a wide range of tours at low fares. Express corridor trains with buffet car accommodation will leave Marylebone at suitable times on Friday, Saturday, Sunday, and Monday, May 13, 14, 15, and 16, and full particulars of times of departure, fares, and other information are contained in this programme, which may be obtained free at Marylebone Station, any of the company's town offices and agencies, or by post from Publicity Department, 216 Marylebone Road, N.W.

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THE South Eastern and Chatham Railway will issue for the Whitsuntide holidays cheap tickets to Brussels (for the International Exhibition) each day from May 11 to 16, *via* Dover-Calais, Folkestone-Boulogne, and Dover-Ostend by express services leaving Charing Cross at 9 A.M., 2.20 P.M., and 9 P.M., returning from Brussels on any day within fourteen days, and by any service. Cheap tickets will be issued to Paris by express services, *via* Folkestone and Boulogne, leaving Charing Cross at 10 A.M. and 2.20 P.M. on May 12, 13, 14, and 15, also on the same dates by the night mail service, returning from Paris at 8.25 A.M. or 2.30 P.M., *via* Boulogne, or at 9.15 P.M., *via* Calais, any day within fourteen days. A cheap excursion to Boulogne will leave Charing Cross at 2.20 P.M. on Saturday, May 14, and Sunday, May 15, returning at 11.45 A.M. or 6.30 P.M. on Whit Monday. Cheap return tickets, available for eight days, will be issued to Boulogne and Calais from May 11 to 16 inclusive, also to Le Touquet and Paris-Plage, *via* Folkestone and Boulogne. On Whit Sunday and Whit Monday special day excursions will be run to Boulogne and Calais. Special cheap eight-day return tickets to Amsterdam, The Hague, Scheveningen, and other Dutch towns, *via* Queenboro', and Flushing, will be issued from May 11 to 16 inclusive. Cheap eight-day return tickets to Ostend will be issued from May 11 to 16 inclusive. Cheap tickets to the Belgian Ardennes will be issued by the Calais, Boulogne, and Ostend routes. During the holidays the Continental services will run as usual. A special restaurant car express service to Switzerland (first and second class), *via* Dover, Calais, Laon, and Bâle, will leave Victoria at 8.50 P.M., and Charing Cross at 9 P.M. on May 13. Special arrangements have been made for holiday-makers over the company's home lines.

THE
Architect and Contract Reporter.
FRIDAY, MAY 13, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No. 4725 Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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## NOTICE TO ADVERTISERS.

**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

**Owing to the Death of His Majesty King Edward, and the Funeral taking place on Friday, May 20, "THE ARCHITECT" WILL BE PUBLISHED AT 2 O'CLOCK P.M. ON THURSDAY, MAY 19.**

## COMPETITIONS OPEN.

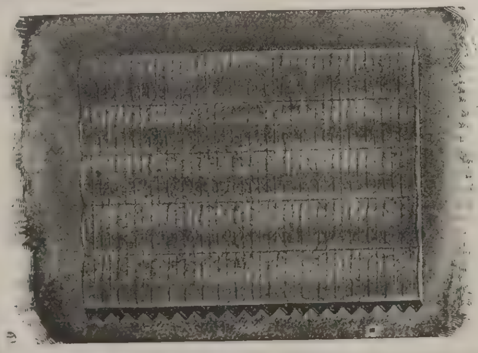
Ashton-on-Mersey.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

Edinburgh.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

Richmond.—May 21.—The Town Advancement Association offer prizes of twenty guineas and five guineas for a double-royal poster exploiting the attractions of the town. The Offices of the Association, 1 The Little Green, Richmond, Surrey.



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## CONTRACTS OPEN.

Allerton.—May 25.—For the various works required in building new mistal, Lee Side Farm, Allerton, Yorks. Send names by May 14 to Messrs. Jackson & Fox, architects, 7 Rawson Street, Halifax.

Alsager.—For erection of farmhouse and buildings at Audley; also farm buildings at Alsager, Staffs. Send names to Mr. T. Bibbey, architect, Cheadle, Staffs.

Bath.—May 16.—For the adaptation of 58 Walcot Street for the purposes of a Labour Exchange. The Postmaster, Head Post Office, Bath.

Barnoldswick.—May 20.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—Barnoldswick Gisburn Road, new infants' school (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Blackpool.—May 18.—For alterations and extensions to the Offices at the Electricity Works. Mr. J. S. Brodie, borough engineer and surveyor, Town Hall, Blackpool.

Bolton.—May 16.—For the adaptation of 9 and 11 Crown Street, for the purpose of a Labour Exchange. H.M. Office of Works, Storey's Gate, London, S.W.

Bradford.—May 18.—For all trades separately excepting painter's, in erection of house at Frizinghall. Mr. Horace E. Priestley, M.S.A., architect and surveyor, 4 Bertram Road, Manningham, Bradford.

Bridgnorth.—May 16.—For works of restoration and improvement at the North Gate. The Borough Surveyor's Office, Bridgnorth.

Brighton.—May 13.—For the construction of an overground lavatory and tram shelter at the north end of Victoria Gardens. The Borough Surveyor, Town Hall, Brighton.

Bristol.—May 24.—For the reconstruction of the roof and alterations to an engine-shed at Bristol for the Great Western Railway. The Engineer, Bristol Station, Bristol.

Chelmsford.—May 20.—For the execution of the following works in the Cattle Market, viz.:—(1) Construction of a roof over Messrs. Rodd & Slipper's stand; (2) construction of a roof over Messrs. Offin & Rumsey's auction ring; (3) erection of a small horse shed of corrugated iron; (4) fixing new manger in, and repairing existing horse shed. The Borough Surveyor's Office, 16 London Road, Chelmsford.

Chopwell.—For the whole of the works required in the erection of eight-roomed house at Chopwell, co. Durham. Mr. A. C. Wood, architect, Burnopfield.

Cockermouth.—May 18.—For re-roofing and other repairs and alterations to Nos. 8 and 10 Castlegate. Mr. Herbert J. Watson, Cockermouth Castle.

Collyweston.—May 14.—For erection of a new public elementary school in the parish of Collyweston, Northamptonshire. Send names by May 14 to Messrs. J. B. Corby & Sons, architects, Stamford.

Cornholme.—May 18.—For the masons', joiners', slaters', plumbers' and plasterers' work required in erection of a minister's house at Shore, Cornholme, near Todmorden. Mr. Job Earnshaw, architect, Town Hall Buildings, Cornholme.

Derby.—May 18.—For erection of a stores and paint shop in timber, and mess room and lavatory, &c., in brick, at the Signal Works, for the Midland Railway Co. The Engineer's Office, Midland Railway, Derby.

Durham.—May 17.—For alterations and improvements at East Hedley Hope, Springwell, Lanehead, South Church and Etherley infants' Council schools. Mr. F. E. Coates, Shire Hall, Durham.

Dublin.—May 17.—For the third section of the Bride's Alley Area Artisans' Dwellings. Deposit 2*l.* The City Architect, Municipal Buildings, Cork Hill, Dublin.

Gateshead.—June 6.—For erecting four cottages for children at Shotley Bridge, for the Union. Send names by May 19 to Mr. G. Graighill, Union Clerk, Poor Law Union Offices, Gateshead.

Glasgow.—May 14.—For the several works required in connection with the proposed reconstruction of the public convenience at St. Vincent Place. The Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.

Glasgow.—May 17.—For steelwork, Glasgow Labour and Telephone Exchange. Deposit 1*l.* 1*s.* Mr. Kennedy, clerk of works, H.M. Office of Works, Head Post Office (Hanover Street entrance), Glasgow.

Glasgow.—May 19.—For the erection of a telephone exchange at Cubic Street, Bridgeton. The Clerk of Works, H.M. Office of Works, Head Post Office, Glasgow.

Halifax.—May 24.—For the various works required in connection with erection of business premises on the Wards End Estate. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Hartfield.—May 21.—For erection of a new class room, &c., at the Hartfield Voluntary schools. Mr. H. C. Nightingale, architect, 2 Judges Terrace, East Grinstead.

Hirst.—May 21.—For the erection of twelve semi-detached houses in Woodhorn Road, for the Ashington Industrial Co-operative Society. Mr. Osborne Blyth, architect, Ashington.

Hull.—May 18.—For the construction of an ornamental shelter at the Cannon Street recreation ground. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

Immingham.—May 17.—For the building of a new Primitive chapel and schoolroom at Immingham, Grimsby. Mr. George H. Allison, architect and surveyor, Regent House, West St. Mary's Gate, Grimsby.

Ireland.—May 17.—For erection of hay shed and lean-to cattle shed, in corrugated iron, at the farmyard at Portrane Branch Asylum, Donabate, co. Dublin. Mr. W. J. Murphy, chief clerk, Grangegorman, Dublin.

Ireland.—May 17.—For the erection of forty single cottages for labourers, and fencing forty plots to same, for the Irvinestown Rural District Council. The Clerk of the Rural District Council, Board Room, Irvinestown.

Ireland.—May 18.—For the erection of a strong room in the Courthouse, Wicklow, at a cost not exceeding 250*l.* The County Surveyor, Council Offices, Wicklow.

Ireland.—May 25.—For the erection of the new Devenish school, Monea. Mr. Thomas Elliott, 37 Darling Street, Enniskillen.

Kingston-upon-Thames.—May 18.—For an air compressor room at the sewage works. The Borough Surveyor's Office, Municipal Offices, Kingston-upon-Thames.

Kirkby Lonsdale.—May 20.—For the various works required in erection of the proposed church room, Casterton. Mr. Thomas M. Banks, architect and surveyor, 14 Finkle Street, Kendal.

Leeds.—May 19.—For the whole or any portion of the work required in extending the Jewish baths at the junction of Albert Grove and Leeds Terrace, off North Street. Mr. J. Lane Fox, architect, Britannia Buildings, Oxford Place.

Liverpool.—May 25.—For erection and completion of a hospital at Alder Hey, West Derby, for the Guardians. Deposit 5*l.* 5*s.* Mr. Harris P. Cleaver, Union clerk, Brougham Terrace, West Derby Road, Liverpool.

London.—May 24.—For the reconstruction of the convenience in Byward Street, E.C., for the Corporation. Deposit 2*l.* 2*s.* The Office of the Engineer, Guildhall, E.C.

London.—May 31.—For the construction of about 1,564 feet of 3 feet 6 inches brick and concrete culvert in Hither Green Lane and Verdant Lane, Lewisham. Payment 5*s.* Surveyor's Department, the Town Hall, Catford.

Lyminge.—May 25.—For erection of four cottages at the Workhouse, Lyminge, for the Guardians of Elham Union. Mr. R. Lonergan, clerk, 29 Bouverie Square, Folkestone.

Mytholmroyd.—May 20.—For the various works comprised in erection of stable and coach house, &c., at Mytholmroyd, Yorks. Messrs. Longbottom & Culpan, architects, George Street, Halifax.

Manchester.—May 17.—For the construction of a subway in Derby Street, Cheetham. Deposit £1 1*s.* The City Surveyor's Office, Town Hall, Manchester.

Manchester.—June 6.—For supplying and fixing tiled dados at the Brookdale Park Municipal school, Newton Heath, and the Moseley Road Municipal school, Fallowfield. Deposit 1*l.* 1*s.* Manchester Education Committee, Deansgate, Manchester.

Newark.—May 23.—For erection of five almshouses, off Hospital Lane. Messrs. Sheppard & Lockton, architects, Bargate, Newark.

Newcastle-upon-Tyne.—For alterations and additions to West Walker Council School. Deposit 2*l.* 2*s.* Mr. A. C. Coffin, Education Offices, Northumberland Road, Newcastle-on-Tyne.

Petworth.—May 18.—For erection of a new post office for the Commissioners of H.M. Works and Public Buildings. Send 1*l.* 1*s.* deposit to H.M. Office of Works, Storey's Gate.

Portchester.—May 21.—For erection of two semi-detached small holdings dwelling-houses at Portchester, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Pudsey.—For the whole or part of the works required in town hall alterations and extensions. Messrs. Jowett Kendall & Sons, architects, South Parade, Pudsey.

Radstock.—May 20.—For erection (stone and slate) of a house, shop, cottage, and stabling, at Wells Road, Radstock (Somerset). Send names by May 20 to Mr. Geo. H. Gibson, building surveyor, Victoria Buildings, Radstock.

Scotland.—May 16.—For the repair of the boundary wall at the St. Andrews Links. Mr. Wm. Watson, burgh surveyor, St. Andrews.

Scotland.—May 16.—For brickwork, joiner, plaster, slater, plumber, and gas-fitting for three cottages to be built at Bowhill, Cardenden. Mr. David Burt, Station Road, Cardenden.

Scotland.—May 17.—For erection of a spire on the U.F. English Church, Stornoway. Mr. Alexr. Macdonald, architect, Municipal Buildings, Stornoway.

Scotland.--May 18.—For mason, carpenter, slater, plasterer, plumber, painter, and glazier works of restoration of hall and rooms, United Free High Church, Forres. Mr. Robert J. Macbeth, architect, Inverness.

Scotland.—May 18.—For the mason, carpenter, and slater work on the Gordon Richmond Estates :— (1) New dwelling-house at Easter Auchairn, Cairnie; (2) new dwelling-house at Horntowie, Cairnie; (3) new dwelling-house at Mosstown, Kinnoir; (4) new dwelling-house at Corncatterach, Gartly; (5) new dwelling-house at Balhenny, Rhynie; (6) reconstruction of cottage at Mains of Lesmoir, Rhynie; (7) repairs on dwelling-house and stable at Faich Hill, Gartly; (8) reconstruction of shepherd's cottage and repairs on offices, &c., at Smithston, Rhynie; (9) repairs on house, offices, and sheep sheds, &c., at Boganclogh and Old Forest, Rhynie; (10) repairs on dwelling-house and offices at Blackmiddens, Rhynie; (11) repairs on Grieve's house, Cocklarachy, Drumblade; (12) repairs on house at Millhill Croft, Gartly (mason and carpenter work only); (13) repairs on cottage at Hillhead, Newtongarry, Drumblade (carpenter work only); (14) attic windows for blacksmith's house, Newtongarry, Drumblade (carpenter and slater work only), and for the plaster work of Nos. 1, 2, 3, 4, 5, 6, and 8. The Estates Office, Huntly.

Shrewsbury.—May 19.—For building a new engine house at Coton Hill. Deposit 1*l*. 1*s*. Messrs. A. B. & W. Scott-Deakin, architects, Shrewsbury.

Stanhope.—May 18.—For erection of an isolation hospital near Stanhope, Durham. Mr. W. M. Egglestone, Stanhope.

Swanscombe.—May 18.—For erection of a new mortuary in the Burial Ground, Swanscombe, Kent. Mr. Frank M. Kirby, architect, Laureston, Greenhithe.

Thornbury.—May 19.—For the various works (painter's excepted) required in erection of a store in Woodhall Avenue, Thornbury, Yorks. Mr. William Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

Waddon (Croydon).— May 25.—For the builders' work necessary in erection of two isolation pavilions and additions to borough hospital administrative block, &c., for the Croydon Town Council. Deposit 1*l*. 1*s*. The Borough Engineer, Town Hall, Croydon.

Wales.—May 16.—For erection of fifteen or more houses at Gilfach, near Bargoed, for the Gwerthonor Building Club. Mr. W. A. Griffiths, architect, Pontllanfraith, Mon.

Wales.—May 16.—For alterations, additions, and drainage works at Tredwgan Farm, Barry. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and surveyors, Church Street Chambers, Pontypridd.

Wales.—May 18.—For erection and completion of a new bungalow cottage, Gwbert Road, Cardigan. Mr. J. Teifion J. Williams, architect, Napier Street, Cardigan.

Wales.—May 18.—For the following works for the Glamorgan County Council, viz. :—(1) Alterations to school house at Bedlinog Council school; (2) new infants' school at Gabalfa, near Cardiff; (3) new mixed department of the Banwen Council school, near Brynamman. The County Council Offices, Westgate Street, Cardiff.

Wales.—May 18.—For erecting a villa residence at Pengam, Rhymney Valley. Send names by May 18, to Mr. J. Llewellyn Smith, M.S.A., architect, Aberdare.

Wales.—May 19.—For the rebuilding of Glantaff factory and the erection of two cottages in Plymouth Street, Merthyr. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—May 21.—For erection of Sunday-school premises at the Congregational church, Abergavenny. Deposit 1*l*. 1*s*. Messrs. Habershon, Fawckner & Co., architects, 41 High Street, Newport.

Wales.—May 21.—For erection of a new church at Abercanaid. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—May 21.—For stripping and reslating, &c., roofs at 62 Charles Street, Cardiff, for the Guardians. Mr. Arthur J. Harris, clerk, Union Offices, Queen's Chambers, Cardiff.

Wales.—May 21.—For taking down two old cottages and erecting three cottages at Dowlais, for the Foresters' Society. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—May 26.—For the erection of a Council school for mixed and infants, at Ty'r Graig, Aberbeeg, Abertillery. Deposit 2*l*. 2*s*. Messrs. Speir & Bevan, Borough Chambers, Wharton Street, Cardiff.

Wales.—May 28.—For erection of twenty-four houses at Argoed, Mon., for the Argoed Workmen's Building Club. Mr. A. F. Webb, architect and surveyor, Blackwood and Tredegar.

Wales.—May 28.—For work of alterations to windows and floors of Treharris boys' and infants' schools, Merthyr Tydfil. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Walton.—May 27.—The West Riding Education Committee invite tenders for the following work :—Walton new Council school (builder, joiner, slater, plumber, plasterer, and painter). Deposit 1*l*. with the Treasurer. The Education Architect, County Hall, Wakefield.

Warwick.—June 7.—For alteration of the premises acquired at the Aston Lower Grounds to fit the same for the requirements of the Territorial units. Deposit 3*l*. 3*s*. Messrs. James & Lister Lea & Sons, architects, 19 Cannon Street, Birmingham.

Wath-upon-Dearne.—May 20.—The West Riding education committee invite whole or separate tenders for the following work, viz. :—Wath-upon-Dearne, Park Road Council school—new infants' department—builder, joiner, slater, plumber, plasterer, painter. Deposit 1*l*. The Education Architect, County Hall, Wakefield.

Willington.—May 20.—For building an additional classroom and carrying out improvements in the main buildings of the Willington C.E. school, Durham. The Corresponding Manager, Willington C.E. School, co. Durham.

Windsor.—May 14.—For the execution of sundry alterations and repairs to two houses at Englefield Green, for converting the same into children's homes, for the Guardians of Windsor Union. Messrs. Edgington & Spink, architects, 52 High Street, Windsor.

Whitley Bay (Northumberland).—May 17.—For provision and erection of a shelter seat in an open space on the Promenade, Whitley Bay. Mr. A. J. Rousell, A.M.I.C.E., surveyor, Council Offices, Whitley Bay.

The City Corporation of London has decided to spend 20,000*l*. on public slaughter-houses at Islington Cattle Market, to meet present requirements and the increased demands which will be made in the near future, as private slaughter-houses in the northern districts of the Metropolis have been abolished.

A demand has been presented to the master builders of Swansea for an advance of a half-penny per hour in the wages of builders' labourers, who number about 200. The Union official has received a letter from the Master Builders' secretary as follows :—" Your letter has been duly laid before my committee, and I have been instructed to reply stating that there has been no labourers' society recognised for many years by this Association, and there is no code of working rules in existence. At the same time, I may say that it is the intention of each builder to deal with the labourers working for them individually." The Union will now call a further meeting of the men and send each builder an application for the advance.

Mr. A. A. Hudson, barrister-at-law, the arbiter appointed by the Board of Trade to consider the claims made by the joiners of Glasgow for a forty-four-hour week and an advance of 1*d*. per hour in wages, has now issued his award. This is to the effect that the by-laws shall remain unaltered for another year. The men put forward a demand for an eight hours working day for the first five days of the week and four hours on Saturday, making a week of forty-four hours, as compared with the present week of fifty hours. They also asked for an advance of wages from 9*d*. to 10*d*. per hour. The employers, on the other hand, asked for a working week of fifty-one hours, and they declined to grant any advance of wages. They wished the men to work one hour longer on Saturday than they do at present, so that they might stop at the same time as their other tradesmen.

# TENDERS.

## BRENTFORD.

For the erection of cottages in Clifden Road, adjoining the Public Baths. Mr. J. W. Croxford, engineer and surveyor, Brentford.

| | | | |
|---|---|---|---|
| Eydmann | £550 | 0 | 0 |
| Whitman | 447 | 0 | 0 |
| Soole & Son | 433 | 0 | 0 |
| Fuller | 411 | 14 | 5 |
| Theaker | 411 | 0 | 0 |
| Dickens | 397 | 0 | 0 |
| **Pasterfield & English**, Streatham (*accepted*) | 358 | 0 | 0 |

## CHIPPING BARNET.

For erection and completion of a manual instruction and cookery centre at Byng Road. Mr. Urban A. Smith, county surveyor.

| | | | |
|---|---|---|---|
| Dudley | £1,273 | 17 | 2 |
| Stewart | 1,203 | 17 | 7 |
| Parren & Son | 1,188 | 10 | 0 |
| Clark & Sons | 1,183 | 6 | 0 |
| Henson & Son | 1,166 | 9 | 0 |
| **Paul**, Waltham Abbey (*accepted*) | 1,097 | 0 | 0 |

## CHISLEHURST.

For cemetery and depôt buildings for the Urban District Council.

| | | | |
|---|---|---|---|
| Grave & Marsh | £6,112 | 3 | 2 |
| Mussellwhite & Sapp | 6,110 | 0 | 0 |
| Skinner | 6,045 | 0 | 0 |
| Ellingham & Sons | 6,012 | 0 | 0 |
| Blay | 5,991 | 0 | 0 |
| Line | 5,982 | 0 | 0 |
| Parker & Son | 5,937 | 0 | 0 |
| Perry Bros. | 5,867 | 0 | 0 |
| Pasterfield & English | 5,798 | 0 | 0 |
| Rider & Son | 5,696 | 0 | 0 |
| Owen | 5,683 | 19 | 0 |
| Knight | 5,680 | 10 | 0 |
| Bulley | 5,675 | 0 | 0 |
| Lowe | 5,659 | 0 | 0 |
| McLaughlen & Harvey | 5,657 | 7 | 5 |
| Friday & Ling | 5,552 | 5 | 9 |
| Falkner & Son | 5,525 | 0 | 0 |
| Wallis, Ltd. | 5,510 | 0 | 0 |
| Cook & Son | 5,448 | 0 | 0 |
| Ramsbottom & Co. | 5,364 | 0 | 0 |
| Moss | 5,280 | 0 | 0 |
| Norris | 5,250 | 0 | 0 |
| Appleby & Sons | 5,086 | 0 | 0 |
| **Howard**, Orpington (*accepted*) | 4,995 | 9 | 0 |

## GILLINGHAM.

For the work of extending the Gillingham Technical Institute, Green Street. Mr. J. L. Redfern, A.R.I.B.A., borough surveyor, Gillingham, Kent.

| | | | |
|---|---|---|---|
| Gates & Son | £2,945 | 0 | 0 |
| Seagers | 2,897 | 0 | 0 |
| Phillips | 2,850 | 0 | 0 |
| **Skinner**, Chatham (*accepted*) | 2,784 | 0 | 0 |

## HANLEY.

For erection of biscuit placing houses, dipping houses, warehouses, &c., one storey building, north light roofs. Messrs. E. L. Maddock & Sons, architects, Hanley.

| | | | |
|---|---|---|---|
| Wardle | £4,077 | 0 | 0 |
| Newton & Johnson | 3,749 | 4 | 5 |
| Ball & Robinson | 3,690 | 0 | 0 |
| Coke | 3,600 | 0 | 0 |
| Bell | 3,550 | 10 | 0 |
| Chatfield | 3,550 | 0 | 0 |
| Grant | 3,550 | 0 | 0 |
| Grant & Son | 3,493 | 0 | 0 |
| Colley & Lindop | 3,493 | 0 | 0 |
| Broadhurst | 3,489 | 0 | 0 |
| Cornes & Son | 3,475 | 0 | 0 |
| Walters, jun. | 3,460 | 0 | 0 |
| Ball | 3,450 | 0 | 0 |
| Thomas | 3,425 | 0 | 0 |
| **Heath**, Stoke-on-Trent (*accepted*) | 3,187 | 0 | 0 |

## HERNE BAY.

For erection of pier pavilion (Contract D). Mr. Percy J. Waldram and Messrs. Moscrop Young & Glanfield, joint architects, 12 Buckingham Street, W.C.

| | Main Estimate A. | Main Estimate C. Reduced |
|---|---|---|
| Thorn & Son | £6,279 | — |
| F. & H. F. Higgs | 5,988 | — |
| J. & M. Patrick | 5,904 | — |
| Jones & Andrews | 5,800 | — |
| Grover & Son | 5,783 | — |
| Stephens, Bastow & Co. | 5,562 | — |
| Kirk & Randall | 5,524 | — |
| Lovatt | 5,164 | — |
| Minter | 5,144 | — |
| Denne & Son | 4,949 | £4,479 |
| **Pattinson, Ltd.** (*accepted*)* | 4,856 | *4,243 |
| Archer & Sons | 4,750 | 4,364 |
| Seager | 4,700 | 4,287 |

## HINCKLEY.

For erection of a house and stabling for Dr. A. J. Stanley. Messrs Heaton & Walker, architects, Hinckley.

| | | | |
|---|---|---|---|
| Moss & Son | £1,735 | 0 | 0 |
| Rowley | 1,530 | 0 | 0 |
| Mason | 1,518 | 0 | 0 |
| Hall & Son | 1,498 | 8 | 0 |
| Clarke | 1,493 | 16 | 0 |
| Clark & Garrett | 1,490 | 0 | 0 |
| Bentley & Co. | 1,487 | 0 | 0 |
| Chaplin | 1,486 | 0 | 0 |
| Goodman & Sons | 1,467 | 0 | 0 |
| Flavell | 1,452 | 0 | 0 |
| Greaves | 1,450 | 6 | 6 |
| Grove | 1,450 | 0 | 0 |
| Jeffcote | 1,441 | 6 | 0 |
| Cole & Sons | 1,438 | 16 | 0 |
| **Littler & Son**, Hinckley (*accepted*) | 1,430 | 0 | 0 |

## LONDON.

For providing and fixing a low-pressure hot-water heating apparatus, including the supply of one boiler and the fixing of two, at York Road L.C.C. school, Islington.

| | | | |
|---|---|---|---|
| Moorwood, Sons & Co. | £974 | 0 | 0 |
| J. & F. May | 938 | 0 | 0 |
| Davis | 860 | 0 | 0 |
| Comyn Ching & Co. | 845 | 0 | 0 |
| Brightside Foundry and Engineering Co. | 827 | 0 | 0 |
| Knight & Sons | 820 | 0 | 0 |
| Grundy | 798 | 10 | 0 |
| Pemberton, Arber & Carey | 792 | 0 | 0 |
| Ashwell & Nesbit, Great James Street, Bedford Row (*recommended*) | 755 | 0 | 0 |
| Architect's estimate | 795 | 0 | 0 |

For providing and fixing low-pressure hot-water heating apparatus at L.C.C. school, Atley Road, Bow and Bromley.

| | | | |
|---|---|---|---|
| Wontner-Smith, Gray & Co. | £935 | 0 | 0 |
| Stevens & Sons | 895 | 0 | 0 |
| Palowkar & Sons | 813 | 0 | 0 |
| Christie | 798 | 0 | 0 |
| Yetton & Co. | 742 | 0 | 0 |
| G. & E. Bradley | 710 | 0 | 0 |
| Tilley Bros., Kingsland Road (*recommended*) | 708 | 5 | 0 |
| Architect's estimate | 735 | 0 | 0 |

For providing and fixing low-pressure hot-water heating apparatus at Fairclough Street L.C.C. school, St. George-in-the-East.

| | | | |
|---|---|---|---|
| Brightside Foundry and Engineering Co. | £671 | 0 | 0 |
| Phillips & Son | 669 | 0 | 0 |
| Yetton & Co. | 667 | 0 | 0 |
| Cannon & Hefford | 666 | 0 | 0 |
| G. & E. Bradley, Lever Street (*recommended*) | 635 | 0 | 0 |
| Architect's estimate | 690 | 0 | 0 |

For providing and fixing a low-pressure hot-water heating apparatus at L.C.C. school, Amberley Road, Paddington.

| | | | |
|---|---|---|---|
| Comyn Ching & Co. | £1,332 | 0 | 0 |
| Turner & Co. | 1,088 | 0 | 0 |
| Brightside Foundry and Engineering Co. | 1,037 | 0 | 0 |
| Davis | 1,015 | 0 | 0 |
| R. H. & J. Pearson | 1,009 | 0 | 0 |
| Yetton & Co. | 960 | 0 | 0 |
| Cash & Co., Caxton House, Westminster (*recommended*) | 954 | 0 | 0 |
| Architect's estimate | 999 | 0 | 0 |

## LONDON—*continued.*

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the reconstruction, on the underground conduit system of electric traction, of the existing horse tramways from Tooley Street to Evelyn Street, Deptford, and the construction, on the same system of traction, of the authorised tramways from Evelyn Street to Nelson Street, Greenwich. The tenders also contain provision for certain paving works outside the tramway tracks in connection with the widenings along the route of the tramways.

| | Tramway Works. | | | Paving Works. | | |
|---|---|---|---|---|---|---|
| Kirk & Randall | £98,857 | 0 | 0 | £35,063 | 0 | 0 |
| Mowlem & Co. | 95,839 | 14 | 3 | 36,072 | 5 | 4 |
| Dick, Kerr & Co. | 95,626 | 14 | 1 | 33,386 | 17 | 0 |
| Coles | 94,587 | 7 | 9 | 29,008 | 12 | 1 |
| Chief engineer's estimate | 98,665 | 6 | 10 | 34,035 | 13 | 4 |

For the erection of sixty-six cottages on the fourth part of Tower Gardens section, and on adjoining plot of land in Benington Road, of the White Hart Lane estate, Tottenham. The proposed cottages comprise fifty-two of four rooms, and fourteen of three rooms, each cottage in addition containing a scullery and the usual offices.

| | | | |
|---|---|---|---|
| Wallis & Sons | £15,964 | 0 | 0 |
| Coxhead | 13,427 | 10 | 0 |
| Monk | 12,300 | 0 | 0 |
| Nicholls & Son | 12,224 | 0 | 0 |
| Rowley Bros., Tottenham (*recommended*) | 11,668 | 0 | 0 |
| Architect's estimate | 13,330 | 0 | 0 |

For the supply and erection of posts and rail boundary fencing at Norwood Park, for the London County Council.

| | | | |
|---|---|---|---|
| Hadley & Sons | £265 | 0 | 0 |
| Longley & Sons | 245 | 1 | 9 |
| J. & S. Agate | 219 | 0 | 0 |
| Clift & Son | 200 | 0 | 0 |
| Stenning & Son | 196 | 5 | 0 |
| Gardam & Sons | 196 | 0 | 0 |
| Bowen | 195 | 0 | 0 |
| Rowland Bros. | 194 | 15 | 0 |
| Horton & Son | 191 | 0 | 0 |
| White, Basingstoke (*recommended*) | 163 | 10 | 0 |
| Estimate | 180 | 0 | 0 |

For the provision of conveniences for men and women at Tooting Common.

| | Marble Concrete Flooring. | | | Granite Concrete Flooring. | | |
|---|---|---|---|---|---|---|
| Johnson & Co. | £605 | 0 | 0 | £584 | 0 | 0 |
| Rice & Sons | 597 | 0 | 0 | 584 | 0 | 0 |
| J. & C. Bowyer | 587 | 0 | 0 | 569 | 0 | 0 |
| Bickerton | 585 | 12 | 6 | 559 | 12 | 6 |
| Lowe & Co. | 525 | 0 | 0 | 510 | 0 | 0 |
| Rowley Bros. | 525 | 0 | 0 | 510 | 0 | 0 |
| Barker & Co. | 500 | 0 | 0 | 475 | 0 | 0 |
| Fletcher | 475 | 0 | 0 | 461 | 0 | 0 |
| Line, 81 Peckham Rye (*recommended*) | 472 | 0 | 0 | 452 | 0 | 0 |

For painting the interior and exterior of the Portobello Road school, Kensington.

| | | | |
|---|---|---|---|
| Clifton | £706 | 0 | 0 |
| Lapthorne & Co. | 653 | 0 | 0 |
| Roberts & Co. | 640 | 0 | 0 |
| A. & F. Polden | 599 | 0 | 0 |
| Johnson | 550 | 0 | 0 |
| Butcher | 525 | 0 | 0 |
| Spencer, Santo & Co. | 481 | 0 | 0 |
| Bristow & Eatwell | 479 | 0 | 0 |
| Brown & Sons | 473 | 0 | 0 |
| Crook & Son | 468 | 0 | 0 |
| Johnson & Co., Wandsworth Common (*accepted*) | 466 | 0 | 0 |
| Architect's estimate | 540 | 0 | 0 |

For the execution of certain works at the Redcross Street fire-station, for the L.C.C.

| | | | |
|---|---|---|---|
| F. & F. J. Wood | £1,283 | 0 | 0 |
| Lawrance & Sons | 1,068 | 0 | 0 |
| Leslie & Co. | 929 | 0 | 0 |
| J. & C. Bowyer | 898 | 0 | 0 |
| Munday & Sons | 886 | 0 | 0 |
| Downs, Walworth, S.E. (*recommended*) | 878 | 0 | 0 |
| Architect's estimate | 1,080 | 0 | 0 |

## SHREWSBURY.

For erecting stables and depôt, Roushill. Mr. A. E. Williams, architect and surveyor, Shrewsbury.

| | | | |
|---|---|---|---|
| G. & W. Edwards | £4,792 | 0 | 0 |
| Roberts | 4,742 | 0 | 0 |
| Pritchard | 4,715 | 0 | 0 |
| Bowdler & Co. | 4,650 | 0 | 0 |
| Barnsley & Sons | 4,624 | 0 | 0 |
| Price | 4,580 | 0 | 0 |
| Bowers & Co. | 4,470 | 0 | 0 |
| Pearce | 4,398 | 0 | 0 |
| Pace | 4,379 | 0 | 0 |
| Bickerton | 4,355 | 0 | 0 |
| Treasure & Son, Ltd. | 4,304 | 0 | 0 |
| Smith & Co. | 4,247 | 0 | 0 |
| Morris & Sons, Shrewsbury (*accepted*) | 4,180 | 0 | 0 |
| Turford & Southward | 4,115 | 0 | 0 |
| Dallow & Sons | 4,080 | 0 | 0 |

## WALES.

For additional wards at the infirmary, Merthyr. Mr. T. Roderick, architect, Aberdare.

| | | | |
|---|---|---|---|
| Hancock | £1,720 | 19 | 1 |
| Davies & Son | 1,545 | 0 | 0 |
| James | 1,498 | 0 | 0 |
| Williams & Sons | 1,466 | 5 | 0 |
| Colborne | 1,389 | 10 | 0 |
| Sullivan, Merthyr (*accepted*) | 1,312 | 12 | 0 |

## WANSTEAD.

For erection of a foreman's cottage at the Wanstead sewage farm, Empress Avenue, Manor Park. Mr. C. H. Bressey, surveyor.

| | | | |
|---|---|---|---|
| Bland | £472 | 0 | 0 |
| Robins | 469 | 0 | 0 |
| Hutchins | 460 | 0 | 0 |
| Webb | 455 | 0 | 0 |
| Newell & Lusty | 450 | 0 | 0 |
| G. & J. Fox | 425 | 0 | 0 |
| F. & G. Foster | 417 | 0 | 0 |
| Webster & Sons | 413 | 0 | 0 |
| J. & J. Dean | 395 | 0 | 0 |
| Woollaston & Co. | 349 | 0 | 0 |
| Joliffe | 348 | 10 | 0 |
| Perton & Co. | 340 | 0 | 0 |
| Surveyor's estimate | 330 | 0 | 0 |

## WEDNESBURY.

For the erection of public sanitary conveniences (exclusive of sanitary fittings) near the Market Place. Mr. E. Martin Scott, borough engineer and surveyor.

| | | | |
|---|---|---|---|
| H. & F. Hallett | £807 | 0 | 0 |
| Teece | 655 | 0 | 0 |
| Summerhill & J. & G. Jellyman | 640 | 0 | 0 |
| Gough & Son | 610 | 0 | 0 |
| Smith, Wednesbury (*accepted*) | 598 | 0 | 0 |

## YEOVIL.

For extensions to factory at Yeovil, for Messrs. Ewens, Johnson & Co. Messrs. John Petter & P. F. Warren, A.R.I.B.A., architects, Yeovil and Southampton.

| | | | |
|---|---|---|---|
| Chapman & Pittard | £2,445 | 0 | 0 |
| J. W. & H. Childs | 2,337 | 0 | 0 |
| Stockham | 2,149 | 0 | 0 |
| Bird & Pippard | 2,125 | 0 | 0 |
| Bryer | 2,000 | 0 | 0 |
| Pittard & Son, Langport (*accepted*) | 1,839 | 0 | 0 |

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We understand that Messrs. Wallis Bros., Ltd., of Maidstone, have been successful in obtaining the contract for new buildings in connection with the Royal Academy of Music in Marylebone Road, London. The approximate price is 50,000*l.*

Mr. J. Walker, assistant to Mr. Dick Peddie, architect, Edinburgh, has been appointed architect to the Local Government Board, in connection with the application of the Housing and Town Planning Bill in Scotland.

Mr. J. R. Thomson, architect, of 5 High Street, Rothesay, formerly sub-factor of the Bute Estate, and designer of many prominent public buildings in the district, who died on March 6 last, aged sixty-eight, left personal estate valued at 4,491*l.*, of which 3,301*l.* is Scottish estate, in addition to which he left real estate of the estimated capital value of about 10,000*l.*

## THE STANDARDISATION OF PAINTS.

THE "Paints Standards" Sub-Committee of the Royal Institute of British Architects has made an interim report to the Science Standing Committee.

The terms of the reference included directions to make an initial search in current literature with a view to ascertaining what has already been done in the matter of standardisation. This investigation has involved the preparation of extracts from a large number of volumes, and the matter collected, though containing facts of great value, proves to be mostly of too technical a character to be translated directly into simple practical terms suitable for use by the profession, and it would appear that but small effort has been made, at least in this country, to deal with the question of standardisation at all, though practical men with whom the Sub-Committee came into contact confirmed the opinion that some standards are desirable. It will further be evident that in the absence of any standards any precise specification is impossible. The Secretary of the American Institute of Architects has been interrogated as to the attitude of the profession towards this question in the United States, but, as yet, no reply has been received. The investigation so far undertaken has, however, impressed the Sub-Committee with the following facts:—(1) That adulteration in paint materials is very common, although it can be shown, generally speaking, that the best materials are the most economical when renewal is considered; (2) that legal definitions are very difficult of formation, and are often based too much upon mere chemical composition without regard to other properties; (3) that the physical condition, particularly that of the size of the particles of solid ingredients, is of very great importance, and that could this be standardised it would form one valuable basis for specification. The durability of paint, given a suitable vehicle, appears to depend, as in the case of concretes, to a very large degree upon the use of scientifically graded aggregates. The absence of any standard of fineness of grinding, moreover, renders it impossible to mix paints to definite tints by using given weights of constituents, which is a great hindrance to the practical man. A short monograph, suitable for the lay reader, embodying a description of the chief characteristics of paint materials, is in course of preparation by the Committee, and it is hoped to present it shortly.

## THE MUNICIPAL EXHIBITION.

AT the Royal Agricultural Hall, Islington, N., there was opened on Saturday of last week the second Municipal and Health Exhibition. Though the stands are not as numerous as on the last occasion the range of the exhibits is wide.

The first stand is that occupied by the *Limmer Asphalte Paving Co.*, who show samples of their material in various stages, and as finally sold for different purposes. The firm have also constructed a section of the Exhibition roadway laid in situ.

*Henry Balfour & Co., Ltd.*, Fife, are represented by a Barker & Hunter's patent reversible concrete mixer and tar macadam machine, capable of producing from 35 to 40 thoroughly mixed batches of concrete or tar macadam per hour. *The Clee Hill Granite Co., Ltd.*, show setts, macadam, rough stone for breaking, and chippings, all of which have been supplied to many of the principal local authorities of England and Wales.

*The British Ceresit Waterproofing Co., Ltd.*, Caxton House, S.W., demonstrate the impermeability of cement mortar treated with Ceresit by subjecting a thin slab to the pressure of a column of water 8 feet high. The slab, however, remains quite dry. This is only confirming the report given last year by the Royal Testing Office of Berlin as to its waterproofing qualities and its resistance to tensile and compressive strains. Ceresit is, we believe, unique in being sold as a paste. On the job it is mixed with the usual diluting water in the proportion of 1—10 or 1—12 and then poured on to the dry cement or concrete, which it is claimed renders it waterproof however poor the ingredients may be. It is found that 1 square yard of mortar $\frac{3}{4}$ inch thick requires 1 lb. of Ceresit, and 1 square yard of mortar 1 inch thick requires $1\frac{1}{4}$ lb. of the paste. With a medium pressure of water it is sufficient for the wall plastering to be 1 inch or $1\frac{1}{4}$ inch thick. Ceresit is applicable both to the interior and exterior of buildings, and is recommended for use in a variety of situations. It is important to remember that the material penetrates throughout the plaster coating and renders the entire thickness waterproof.

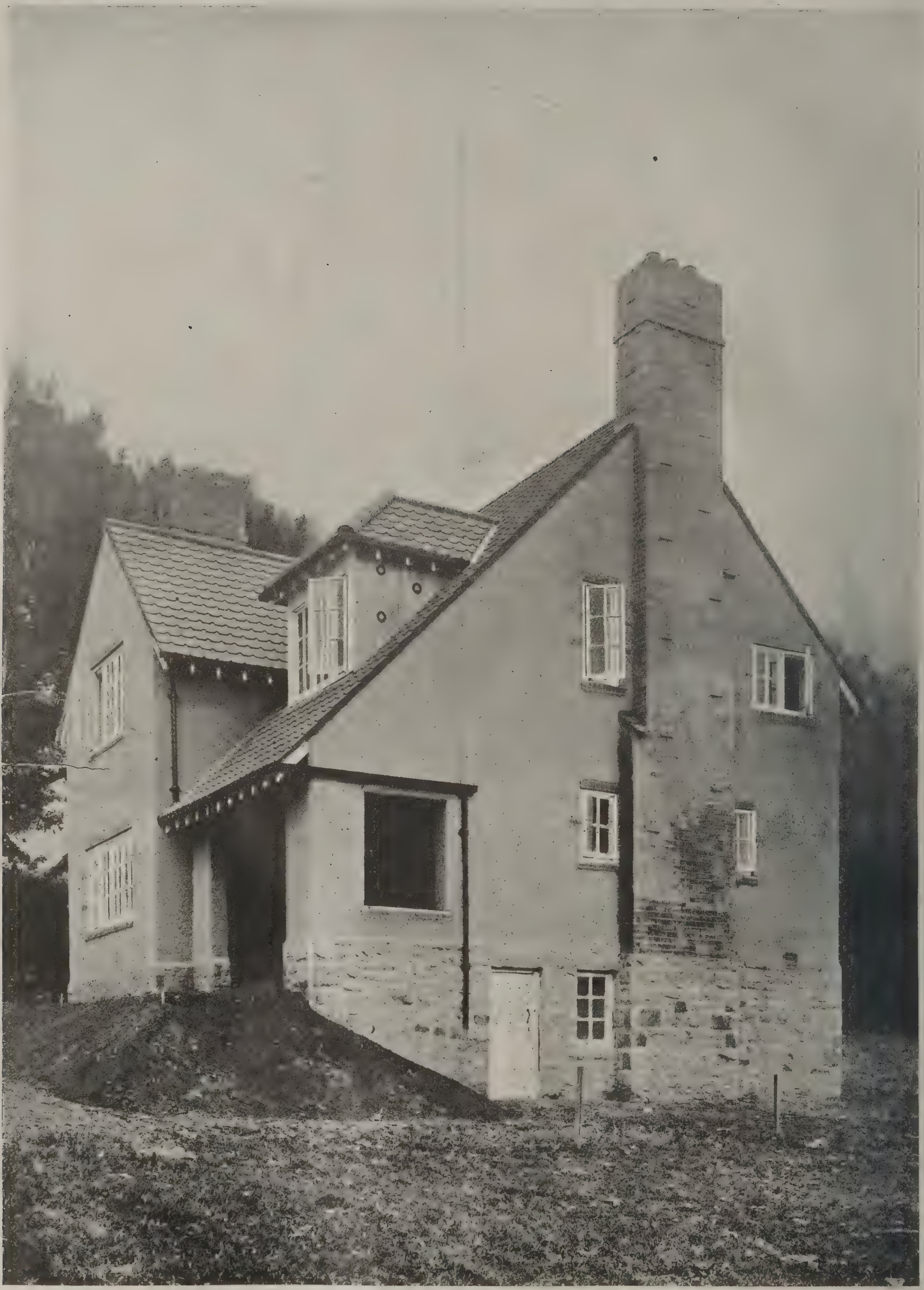
*Messrs. Cookson & Co., Ltd.*, show samples of their "Crescent" brand white lead and other of their products. *The British Cork Asphalte, Ltd.*, have laid two specimens of "cork adamant" jointless flooring, as well as samples of their other materials, including Corkite, Corketa, and Cormastik. *Messrs. Babcock & Wilcox, Ltd.*, have in operation a water-softening plant of 500 gallons per hour capacity, as well as models of a chain grate stoker and a boiler fitted with superheater. *Moffats, Ltd.*, lighting engineers, show the Lucas inverted lamp, the improved Lucas light for thoroughfares, and a Lucas light adaptation. *The Acme Flooring & Paving Co.* (1904), *Ltd.*, is among the firms who have laid a section of the Exhibition roadway in the hall; their Acme sectional woodpaving has been adopted in the past by many London and provincial authorities. *The Cubitt Concrete Construction Co.* display a large moulded column of reinforced concrete executed in Medusa white Portland cement and treated with Medusa waterproof compound. This is one of a contract now being executed at Government House, Salisbury, Rhodesia. This white cement complies with all the requirements of the British Standard Specification. On the same stand are examples of reinforced Siegwart pipes and poles, and a specimen partition wall of concrete plastered with finishing coat of white Portland cement and reinforced with "Hy-rib" metal.

One of the novelties and one of the features of the Exhibition has undoubtedly been at Stands Nos. 21 and 24, where the *Metal Jointing Co., Ltd.*, 71 Strand, W.C., have been giving constant demonstrations of their system for jointing metals. The efficiency of their "Amalgaline" is a never-failing source of astonishment and delight to all who see it for the first time. "Amalgaline" is a thin metallic flux $\frac{1}{500}$ inch thick, treated with a composition so as to prevent the formation of oxides. If a joint is required in a lead pipe the process is as follows:—A patent tool cuts the ends to a dead true in the form of a spigot and socket; a piece of the ribbon is inserted between the surfaces; heat is applied by a blow-pipe or blow-lamp and the ribbon quickly melts and the metals amalgamate. The resulting joint is as strong as it is neat and will resist any twisting or bending strain or test under hydraulic pressure. The whole operation is of the utmost simplicity and is completed in an incredibly short time. As proof of the perfect amalgamation we might mention that when the pipe was sawn open it was impossible to detect the joint in the thickness of the metal. The Metropolitan Water Board after a searching test accepted this method of jointing as satisfactory. The firm's interesting exhibit is divided into three sections—(1) sanitary and water, (2) electrical, (3) marine and chemical. It is evident that "Amalgaline" is possessed of a great future.

*Messrs. Thos. Parsons & Sons*, 8 Endell Street, W.C., call stands Nos. 22 and 23 "Ye Olde Varnish House," and have been at considerable pains to display their varnishes and enamels. The doors and panels are resplendent with British-made Endelline, while British-made Endelflat gives a dignified decoration for walls, ceilings, lincrusta, &c. There are also samples of their cheaper enamel, Lacreite, as applied on Clark & Co.'s Xelite Plaster. The interior of the stand affords a notable object lesson to the many house owners and house decorators who are now carrying out or about to carry out their spring cleaning and painting. Messrs. T. Parsons & Sons have behind them all the prestige accruing from a century's experience in varnish making.

*Messrs. Doulton & Co., Ltd.*, have a severely practical exhibit. It comprises London-made stoneware pipes (Dorset clay), Midland stoneware pipes, the "Borough" street gully, &c. Conspicuous on the stand is the length of stoneware pipe demonstrating their well-known patent "Grouted Composite" joint for the construction of watertight sewers in waterlogged ground. *Palmer's* travelling cradles are shown together with one of the firm's suspended steel cages and their patent ladder scaffold. The company enjoy a unique reputation for this special class of work. An interesting feature of the stand is the finishing operations being carried out on their patent wire scaffold lashings, which are made in 15-foot lengths. *The St. Pancras Ironwork Co., Ltd.*, show a steel single folding door, a "check" door, a straight staircase, and a spiral staircase of special construction. *Messrs. C. Jennings & Co.*, Bristol, have a variety of woodwork. *Featherstone's Automatic Adaptor and Fire Valve Co.* show how simple and effective a combination tap and adaptor is for household purposes. It can be substituted for any tap and comes into automatic operation immediately the hose is extended.

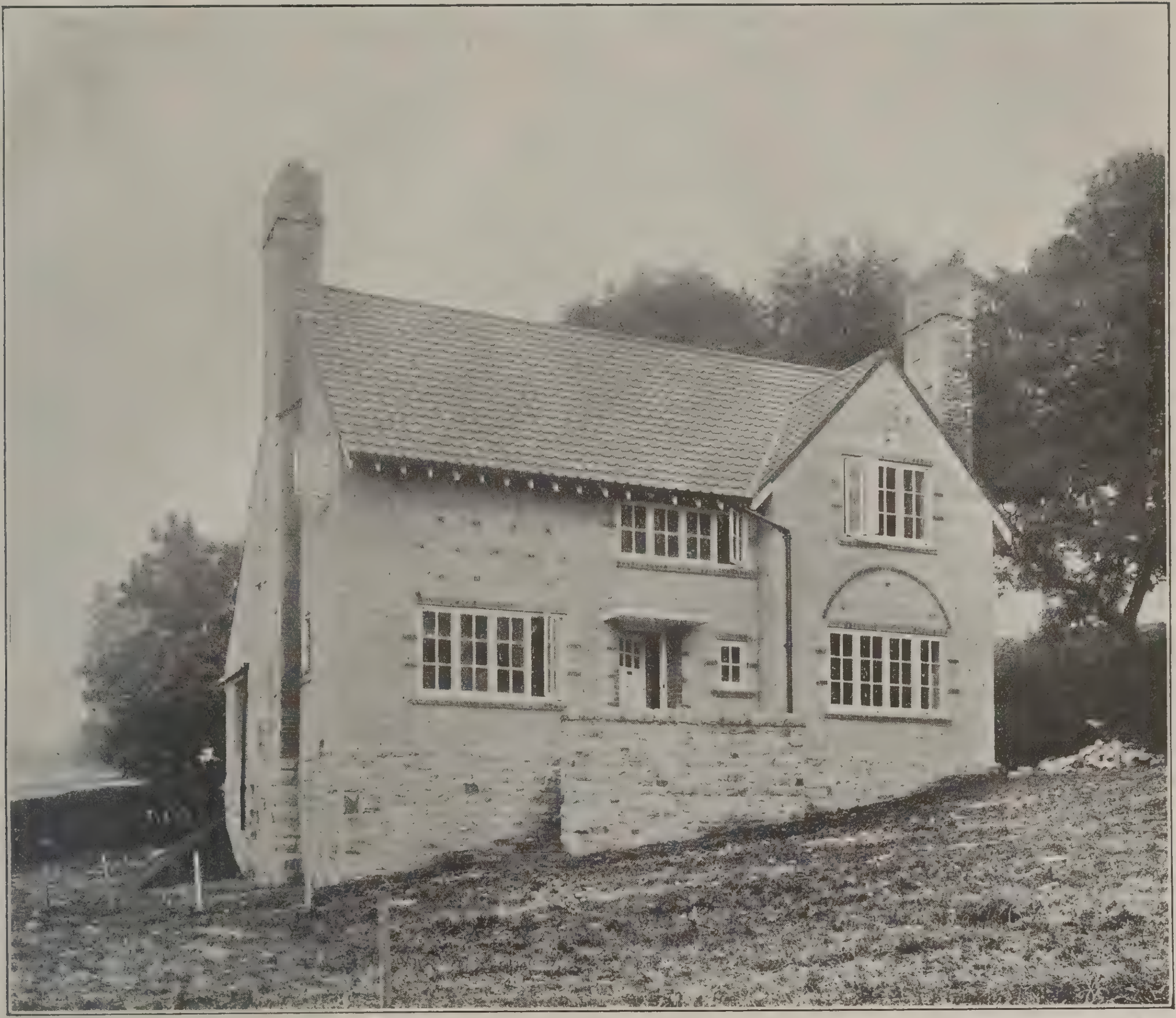
THE Chester education committee on Tuesday approved the plans for the new city and county school, where accommodation will be provided for 120 boys and 150 girls. The site of the new building is in Handbridge, and the estimated cost is about 11,000*l*.

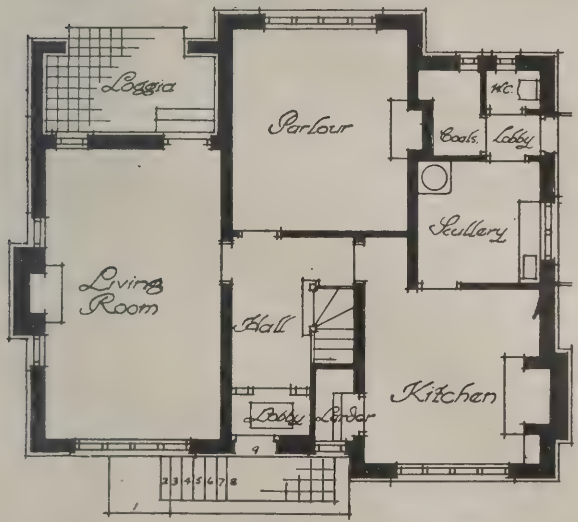


COTTAGE AT HEXHAM-ON-TYNE.—Mr. Edward Cratney, Architect.

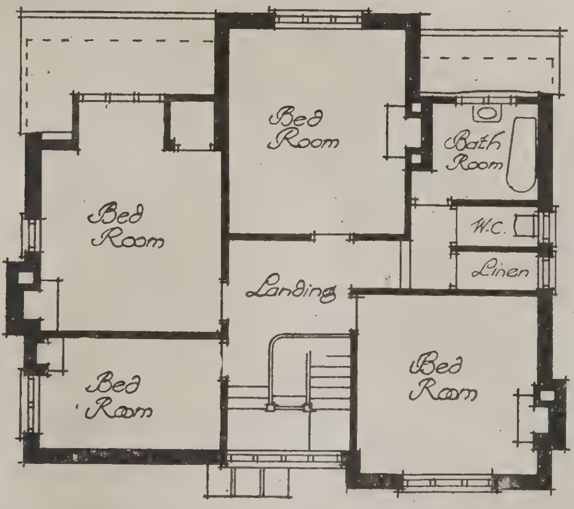
## COTTAGE ON THE WHETSTONE HOUSE ESTATE, HEXHAM.

This cottage, which forms the first of a series to be erected on the above estate, is situated on sharply sloping ground. Advantage has been taken of the sloping ground to plan a large garden or general store-room under the living-room, with an entrance and window, on the lowest side of the house. The external walls are 11 inches thick, built with a hollow space, and of common local bricks. The exterior is rough-casted with two coats of Portland cement dashed with white Derbyshire spar. The base of the walls up to the ground floor level is built of local rubble. The chimney stacks are faced with "Lumley" red pressed facing bricks. The floor of the loggia, the steps, and the landing at the entrance are paved with bricks on edge set in cement. All the internal joinery has been kept quite square, and the interior, generally, is finished quite simply. Green's special French tiles were used on the roof, and Couzen's hinges to the opening sashes of the casement windows. The accom-





Ground Floor Plan



First Floor Plan

COTTAGE AT HEXHAM-ON-TYNE.—MR. EDWARD CRATNEY, Architect.

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modation, beside the garden or store-room on the sub-ground floor, includes a large living-room opening on the loggia, a parlour, small lobby and hall, kitchen, scullery, and offices on the ground floor, with four bedrooms, bathroom, linen-room, &c., on the upper floor. The builder was James I. Murray, of Hexham. The facing bricks were supplied by the Lumley Brick Company; the grates, mantels, door furniture, and bells by Emley & Sons, of Newcastle; and the electric wiring, &c., was carried out by the Hexham Electric Supply Company. The cottage was designed by, and erected under the supervision of Edward Cratney, architect, Wallsend-on-Tyne.

## COMPETITION.

LEEDS.—The Leeds Industrial Co-operative Society, Ltd., announce that in the competition for designs and plans for their new business premises and offices to be erected in Albion Street, the authors of the premiated designs by the assessor, Mr. F. E. L. Harris, A.R.I.B.A., of Manchester, are as follows:—First prize (100*l*.), Messrs. Bradshaw & Gass, Bolton; second prize (50*l*.), Messrs. Latrobe & Weston, Bristol; third prize (25*l*.), Messrs. Thomas Newby & Son, Manchester.

## THE INSTITUTION OF CIVIL ENGINEERS.

AT a recent ordinary meeting of this Society, Mr. J. C. Inglis, President, in the chair, the paper read was "The Use of Reinforced Concrete on the Wabash Railway, U.S.A.," by E. R. Matthews, Assoc.M.Inst.C.E., and A. O. Cunningham, M.Am.Soc.C.E.

This paper described the methods of design and construction employed in the use of reinforced concrete for various structures on the Wabash Railroad. Railway engineers were among the first in the United States to recognise the advantages of using reinforced concrete in engineering construction, and this material has now been used extensively on the railways there, more particularly in the building of bridges, culverts, subways, and retaining walls.

The Wabash Railroad Company was one of the pioneers in such construction, having commenced its use as early as 1902. This railway is one of the leading lines in the Middle West, and has a total length of 2,500 miles. Its headquarters are at St. Louis, and it extends to the cities of Chicago, Detroit, Toledo, and Buffalo on the east of the Mississippi River, and to Kansas City, Des Moines, and Omaha on the west.

In the paper examples of bridges, culverts, and pipes in reinforced concrete were described. In designing the structures referred to the live load was assumed to be equivalent to two coupled "consolidation" engines and tenders, followed by a uniform train-load, placed so as to give the greatest stress in the structure. Impact stresses, which were taken as equal to the square of the maximum live-load stress divided by the sum of the dead- and live-load stresses, were allowed for, and the working stresses were obtained by combining the maximum dead-load, live-load, and impact stresses. The unit stresses allowed were:—

| | Pounds per square inch. |
|---|---|
| Steel, tension on net section of rod | 18,000 |
| Steel, bond on deformed bars | 100 |
| Concrete, compression in cross bending | 800 |
| Concrete, direct compression | 600 |
| Concrete, shear (diagonal tension) in plain concrete | 30 |
| Concrete, shear (diagonal tension) when web is properly reinforced | 100 |

the steel bars being specified to have an elastic limit of 55,000 to 65,000 lbs. (24.5 to 29 tons) per square inch, and the concrete to consist of one part of Portland cement, two of sand, and four of stone or gravel. In proportioning the concrete and steel the formulas devised by Professor Talbot, of the University of Illinois, were employed. Most of the reinforcement used consisted of corrugated bars in the form invented by Mr. A. L. Johnson. These bars are square in section, with corrugations on all four sides, the sides of the ribs being practically at right angles to the axis of the bar. The bars are rolled from high-carbon steel, with a breaking stress of about 105,000 lbs. (47 tons) per square inch, and an elastic limit of 66,600 lbs. (30 tons) per square inch.

The concrete was what might be termed a wet mixture, it being the usual practice in the United States in reinforced concrete work to put in the concrete in this manner. The advantages of so doing are, first, that a more dense and homogeneous concrete is obtained, and, secondly, that the reinforcement becomes better imbedded, every portion of it being well covered by the cement; rusting of the metal is thus prevented.

The authors stated that any fear as to the excess of water weakening the concrete has been proved to be groundless by the experiments carried out by Mr. G. W. Rafter for the State Engineer's office of New York.

Among the bridges described were the Sangamon River Bridge and a bridge in Forest Park, St. Louis.

The Sangamon Bridge is a double-line, four-arched skew-bridge with abutments and arches of reinforced concrete and piers of solid concrete, reinforced at the base and toes. Each pier is carried on timber piles driven into very stiff clay. The angle of skew is 45 degrees; each arch has a semicircular square span of 61 feet in the clear, and a skew span of 100 feet between centres of piers. The arch rings are heavily reinforced with upper and lower ribs of 1-inch square rods 12 inches apart, crossed by 1-inch square rods about 4 feet apart, laid parallel with the piers. The joints in the ribs are formed by overlapping the rods. The minimum cover over the reinforcement is 2 inches, and the thickness of the concrete below the ribs in the arches varies from 6 inches at the crown to 24 inches at the springing. The features of particular interest in this bridge are the abutments and the method of providing square bearings for the arch-ribs at the skew-backs. The abutments are practically boxes divided by horizontal and vertical partitions into four compartments. The slab for carrying the road-bed is reinforced with longitudinal rods 24 inches and transverse rods 4 inches apart, the ends of alternate rods being bent up at an angle of 45 degrees. The cost of this bridge was 25,100*l*.

The Forest Park Bridge consists of concrete abutments carrying an 80-foot double-line through-girder bridge. The abutments are of the hollow type, namely, thin reinforced face-walls supported by counterforts resting on slab foundations. The principal features are the curved wing-walls, the concrete fascia and balustrade carried by the outside girders, and the other ornamental concrete work. The counterforts not only carry the girders, but also act as ties to hold the face-wall of the abutments. The reinforcement in the abutments consists of ¾-inch square corrugated rods. The bridge floor is of concrete 8 inches thick, and is reinforced in both faces with ½-inch rods. This floor-slab is carried on 15-inch steel I-beams, which are rivetted by connecting angles to the webs of the girders, and are spaced 18 inches apart between centres. This substructure and the ornamental work were constructed by contract, but the railway company erected the steelwork themselves. The cost was 4,565*l*., but this included the removal of an old bridge and its stone substructure; also a large amount of excavation on account of increasing the width of the opening, and the necessary temporary bridging to provide for the traffic. As this bridge was built during the St. Louis World's Fair, and as more than 300 trains crossed it per day, it was impossible to remove the extra earth and the old bridge with trains, so that it was necessary to do this work with teams at a higher cost.

Illustrations were given of alternative arrangements of solid reinforced concrete floors for various types of bridges, the cost of which varied between 16*s*. and 20*s*. per lineal foot of floor 13 feet wide. Where it was necessary to have a watertight floor a mixture of one part of cement and three parts of coarse sand was used, but where water-tightness was not necessary, *e.g.* where the bridge crossed a stream, the slab was made of the normal 1 : 2 : 4 concrete. In connection with the waterproofing of reinforced concrete structures, allusion was made to a bridge built two years ago over Junction Avenue, an important street in Detroit. This is a solid-floor plate-girder bridge, which it was necessary to make absolutely watertight, and the waterproofing on the top of the main floor was specified to consist of a 1-inch coating of Wunner bitumen emulsion, cement, and sand. This was not done, however, the bitumen emulsion being mixed directly in the main body of the concrete, making this particular work rather expensive, but satisfactory, as no leaks have occurred since the bridge was erected. The steel-plate girders are each 72 inches deep and 61 feet 7 inches in length over all, and between them are 12-inch steel I-girders, on which the floor system is carried. The floor beams are surrounded by concrete, which is reinforced with ½-inch square longitudinal and transverse rods. The upper surface of the concrete is covered with a 1-to-3 bitumen mortar, which consists of 2 lbs. of bitumen emulsion to every sack of cement (90 lbs.) and 300 lbs. of sand. The cost of this floor was 2*l*. 14*s*. 5*d*. per lineal foot.

Standard designs were adopted for reinforced concrete box culverts for spans rangings from 4 feet to 20 feet. In the larger sizes the reinforcement in the top and bottom slabs and the side walls is supplemented by diagonal reinforcement at the four angles of the section.

Reinforced concrete pipes were made in 3-foot sections with a diameter varying from 2 feet to 4 feet. The reinforcement consists of woven-wire fencing, supplemented by ¼-inch longitudinal bars. In the construction of the pipes inside and outside forms are used, the casing being 2 inches in thickness, and lined with No. 20 gauge galvanised iron. The 4-foot pipes are 4 inches in thickness, the inside and outside reinforcement having a 1-inch covering of concrete.

The cost for a 3-foot length is approximately:—

| | *s.* | *d.* |
|---|---|---|
| 2 feet in diameter | 13 | 6 |
| 3 ,, ,, | 18 | 4 |
| 4 ,, ,, | 23 | 8 |

and the form is estimated to cost 4*l*. 1*s*. 8*d*.

It was formerly the custom to use pipes 8 feet in length, but in order to make them of this length it was found necessary to use derricks in handling the forms, and platforms to do the pouring from. Further, in shipping 8-foot lengths it was necessary to pay particular attention to blocking, so that the pipes would not roll and break themselves to pieces. For these reasons it was decided to build a pipe of such length that the forms could be handled by two men, and could be filled from the ground without the use of platforms. It is still found necessary to load the pipes by means of derricks, but they can be shipped on end and unloaded and placed in position without machinery.

No special test-loads were used to test a structure after it is completed, as this was considered unnecessary. Inspections are made on all bridges on the Wabash Railway, including, of course, reinforced-concrete structures, by a competent inspector once every month. The engineers in charge of the divisions on which the bridges are situated also inspect them each half-year.

None of the many reinforced-concrete structures on this railway have needed any repairs since they were built. They are very rigid under loads, and their appearance indicates that they will outlast any other kind of structure, and require no maintenance. A great many have now been in the track more than five years, carrying loads very nearly as heavy as the live load used in designing them. Attempts have been made to determine the deflection in reinforced-concrete structures due to train-loads, but none can be detected under ordinary measurements.

It is considered that sufficient time has now elapsed to demonstrate the fact that reinforced concrete is reliable; it is undoubtedly permanent, and as good, if not better, than cut stone for the construction of bridges, culverts, and similar work; it is certainly cheaper. Compared with steel, reinforced concrete is altogether superior, as it requires no maintenance. It is thus in most cases preferable to other kinds of construction, and is used where possible on the Wabash Railroad.

## HOURS AND EARNINGS IN THE BUILDING TRADES.

The Board of Trade recently issued the third volume of the report of an inquiry into the earnings and hours of labour of workpeople of the United Kingdom. The two volumes previously issued related to the textile trades and the clothing trades respectively; the latest Yellow Book deals with the earnings and hours of labour in 1906 of workpeople employed in the building and woodworking trades.

The total number of workpeople employed in the United Kingdom in those trades is estimated at approximately 1,250,000, and of these about one million belong to the different branches of the building trades. They include a large proportion of skilled workmen, many of whom served an apprenticeship of from three to seven years. Roughly one-third are bricklayers and masons and their labourers, one-third carpenters and joiners, and one-sixth painters, decorators and glaziers. In response to the inquiry, returns covering 180,000 workpeople, or about 14 per cent. of the estimated total number employed, were received from employers, and of these 95 per cent. were time workers.

This proportion is less than was obtained in the textile and clothing trades owing to the fact that in the building trades, in which the number of employers is very great, schedules were sent only to a limited number in each town or district. The 5,000 returns received were furnished by both large and small employers and, in the opinion of the department, are sufficient to serve as a basis for an accurate statement of average earnings, owing to the widespread prevalence in these trades of standard time rates of wages for the principal classes of workpeople. In nearly every town of importance rates of wages and hours of labour have either been fixed by agreement between representative bodies of the employers and the workpeople or, if not the subject of formal agreement, are well recognised. As a consequence a small number of returns from a given town is usually fairly representative of local conditions.

The particulars obtained as to earnings were as follows:—(1) A return showing the number of workpeople employed and the total amount of wages paid in the last pay-week, or other ordinary week, in each month of 1906, together with the total wages bill for the year; and (2) a return showing the individual earnings of all workpeople employed in one week of 1906, the week for which particulars were asked in the case of the building trades and the construction of harbours, &c., being an ordinary week in the summer, and in the case of saw-milling, machine joinery, &c., and cabinet making, &c., the last pay-week of September; the latter being the week to which the returns for the inquiry as a whole relate.

For all the workpeople in the building trades included in the returns the average net earnings per head in an ordinary week in the summer of 1906 were 28*s.* 6*d.* The average for men was 31*s.* 6*d.*, and for improvers and apprentices of all ages and lads and boys under twenty years of age 10*s.* 3*d.* Excluding the large proportion who worked either less or more than the ordinary hours in that week the average full time earnings of all workpeople were 28*s.* 1*d.*, of men 33*s.* and of improvers, apprentices and lads and boys 9*s.* 7*d.* The average full-time earnings of the principal classes of skilled men (bricklayers, masons, carpenters and joiners, slaters, plumbers, plasterers, and painters) in that week were 36*s.* 4*d.*, and of labourers were 24*s.* 5*d.* In these trades the earnings of workpeople in towns with a population of and above 100,000 are shown separately from those of workpeople in towns of less than 100,000, and as was to be expected earnings in the great towns are found to be higher than in the smaller towns.

In the construction of harbours, docks, roads, sewers, &c., the average earnings of all men, including those who worked less or more than full time, in an ordinary week in the summer of 1906, were 27*s.*, and of those who worked full time 31*s.* 10*d.*, while for lads and boys the corresponding averages were 13*s.* 1*d.* and 13*s.* 6*d.*

In the saw milling, machine joinery, and wood box and packing case making industries, the average earnings of all workpeople included in the returns in the last pay-week of September, 1906, were 22*s.* 7*d.*, the average for men being 27*s.* 1*d.*, for lads and boys 9*s.* 8*d.*, for women 11*s.* 7*d.*, and for girls 7*s.* 10*d.*

In the cabinet making and allied trades, including shop fitting and chair making, the average earnings of all workpeople in the last pay-week of September, 1906, were 25*s.* 3*d.*, the average for men being 32*s.* 1*d.*, for lads and boys 8*s.* 10*d.*, for women 12*s.* 9*d.*, and for girls 6*s.* 1*d.*

It should be borne in mind in any comparisons which may be made between the earnings of workpeople employed in the building trades and construction of harbours, docks, &c., and those of workpeople in saw milling and cabinet making, that the earnings in the former trades are lower in winter than in summer, the number of hours constituting a full week being usually less in winter, and the climatic conditions not so favourable.

From the tables it would appear that in London wages are well above the general level for the rest of the United Kingdom, the next highest district on the whole being the Northern counties and Cleveland. The lowest paid district is Ireland.

In the building trades separate figures are given for towns with a population of and above 100,000 and for towns with a population of less than 100,000, the results showing that, taking the United Kingdom as a whole, the average earnings in summer of men working a full week were 4*s.* 10*d.* higher, and the average weekly working time in summer 2.4 hours shorter, in the large towns than in the smaller.

The average hours constituting a full week (exclusive of mealtimes and overtime) in summer, so far as returned, were 52.9. The full-time earnings of the men, the great bulk of whom were paid at hourly rates of wages, were therefore equal to an hourly rate of slightly less than 7½*d.* The average hours constituting a full week in winter were 45.9, so that on the same basis the full-time earnings of men in winter would average about 28*s.* 8*d.*, or 13¼ per cent. below the summer wage of 33*s.* Regarded from another standpoint, the reduction of hours in winter may be looked upon as involving a loss of working time amounting on the average to seven hours per week during a period of 14.3 weeks, or the equivalent on the basis of summer hours of 1.9 full weeks per annum. On the average, for every ten workpeople required to carry on the work of the building trades in summer, only about nine were required in winter. The wages of apprentices, who form the bulk of the lads and boys, are usually computed on a weekly basis, and do not vary in winter.

The general course of employment throughout the year, as shown by the returns, may be briefly described as follows. The number of workpeople employed rose rapidly from January to April, rising above the average for the year at the end of March, and reaching the maximum at the end of May; then falling in June and July to a point below that in April, but rising again at the end of August nearly to the level of May. After August the number again declined, and at the end of October was lower than in March, the number in the last week of October being just below the average for the year. A further fall took place in November and December. In the great towns the fluctuations shown by the table were somewhat less on the whole than in the smaller towns. In London and some other of the great towns, there were two distinct seasons, one in the spring and the other in the late summer, the number employed falling considerably in June and July. In the smaller towns the maximum was usually reached in the early months of the summer, the number then falling gradually until the end of October, after which the fall was more rapid. In Scotland, in anticipation no doubt of the annual term for house-letting (which is in May), the season was earlier than in England, the maximum being reached at the end of April; in Ireland it appears to have been later.

Average earnings followed much the same course as the numbers employed, except that the rise and fall were greater, owing to the reduction in hours in the winter months.

The returns relating to workpeople employed in the building trades which were obtained as a result of the inquiry made by the Board of Trade in 1886 as to the rates of wages in various industries—the only previous inquiry of a nature similar to the present one—do not allow of comparison with the results now presented, inasmuch as the earlier inquiry was far more limited in scope, covering only some 4 per cent. of the number of workpeople embraced by the present inquiry. While, however, it is not possible to compare the results of the two inquiries directly, the information available as to the rates of wages paid in the principal occupations in these trades in 1886 and 1906 respectively is very considerable, and as the 1906 inquiry shows that the standard wages are very generally paid the result of a comparison of the standard wages recognised at the two dates would probably not differ materially from that of a comparison based on the averages of the wages actually paid for a full week.

From the recorded changes in rates of wages in the building trades published annually by the Board of Trade it is possible to show approximately the relative positions of wages for a series of years. On page 58 of the Thirteenth Abstract of Labour Statistics the changes in rates of wages in the building trades in the years 1879-1908 are combined and expressed by the system of "index numbers," the year 1900 being represented by 100. For 1886 the index number was 84.45, and for 1906, 100.00, the latter figure being about 18 per cent. higher than the former.

Rates of wages in the building trades in the years immediately preceding and following 1886 and 1906 were practically stationary, and whether the averages for the particular years or for the five-year periods 1884-88 and 1904-8 respectively be compared, the percentage advance in hourly rates is the same.

The average number of days per annum on which building operations were, as a rule, suspended for holidays was 9.5 in towns with a population of and above 100,000, and 8.6 in towns with a smaller population. The number varied considerably from district to district. Since practically all the workpeople were paid at hourly rates, there was no payment of wages for holidays; but on certain of these days, if work for any reason was required to be carried on, double the ordinary rates were usually paid.

## VARIETIES.

Mr. G. E. Beaumont, sanitary surveyor, has prepared plans for a small-pox hospital to be erected by the Wortley Rural District Council, at a cost of 2,000*l.*

Mr. R. Frank Atkinson, F.R.I.B.A., has been appointed by the Midland Railway Company architect for the proposed work to the Adelphi Hotel, Liverpool.

The Barnsley Town Council propose to apply to the Local Government Board for their sanction to the borrowing of 13,200*l.* for the erection of a new school in Grove Street.

The Inverkeithing Town Council have commissioned an architect to prepare a plan for the laying out of the Council's grounds at Jamestown for feuing in view of the developments at Rosyth Naval Base.

Stranraer Dean of Guild Court have approved the plans of the secondary school which is to be erected in Lewis Street. The building has accommodation for 260 pupils. The cost is estimated at about 9,000*l.*

The National Association of Master House Painters of England and Wales are completing their arrangements for their annual convention and exhibition, which is to be held in the St. George's Drill Hall, Newcastle.

Weybridge Urban District Council have approved a scheme submitted by the Surrey Education Committee for the erection of a technical institute, on land belonging to the town, at a cost of 3,884*l.* of which the Council are to find 1,292*l.*

Mr. J. Walker Smith, burgh engineer, Edinburgh, has, it is understood, been appointed head engineer under the Town Planning Act to the Scottish Local Government Board. Mr. Smith was appointed burgh engineer for Edinburgh in September 1908, in succession to Mr. Massie.

The Dudley Education Committee recommend the Town Council to borrow 2,500*l.* towards the cost of a hostel in connection with the training college, to accommodate fifty students, the sum being 25 per cent. of the estimated total outlay, the remainder to be found by the Government.

Mr. Lever has paid 100*l.* to Mr. E. Prestwich, a third-year student of the School of Architecture, for the right to use his scheme for laying out the central portion of the village round the church at Port Sunlight. Mr. Prestwich's design was placed first in the recent competition held in the school for prizes Mr. Lever offered for this subject. Mr. Prestwich, therefore, in addition to his prize of 20*l.*, gets a further 100*l.*, and has the pleasure of seeing his work actually carried out. Mr. Prestwich is the son of Mr. J. C. Prestwich, architect, of Leigh, Lancashire.

The minutes of George Heriot's Trust, Edinburgh, bear that at a meeting of the Heriot-Watt College committee a letter was read from the secretary of the Edinburgh College of Art desiring the co-operation of the governors in the institution of a diploma course in architecture, which would include (1) a course of study in the subjects taught in the College of Art, and (2) a course of technical subjects taken at the Heriot-Watt College. A sub-committee, consisting of the convener, Professor Darroch, and Mr. R. C. Millar, was appointed to confer with representatives of the governing body of the College of Art, and thereafter to report.

The Swansea Hospital Board on the 6th inst. accepted a scheme for alterations and additions at a cost of about 25,000*l.* It provides for the raising by one storey of the whole of the north and south wings, and the enlargement of the western block of the north wing (casualty department and Patti ward) to provide an enlarged casualty department, displacing the dispensary with recovery rooms provided with four beds for doubtful cases. In the south wing there will be two new wards for eight and twenty-six beds. Altogether the additional beds will be eighty-four, and each wing roof will be flat, available for recreation and open-air treatment. Mr. Glendinning Moxham, F.R.I.B.A., Swansea, is the architect.

## RAILWAY HOLIDAY ARRANGEMENTS.

With the near approach of Whitsuntide one's thoughts naturally turn to the early summer holiday, and the possibilities afforded by the railways of making the most of the short vacation by taking advantage of one of the numerous excursions by rail, river, or sea, in order to sample some likely locality for the subsequent and longer holiday. In this respect the "Emerald Coast" is always a source of attraction to the holiday-maker at Whitsuntide, and taking into account the varied and interesting nature of the journey, of which 158 miles are by rail, and over 300 miles by sea, it would be difficult to select a more economical trip than that to St. Malo and back, via Southampton, announced by the London and South-Western Railway, at a fare of 24*s.* 6*d.*, third-class rail and second-class on steamer. These tickets will be issued from Waterloo on the Thursday and Saturday before Whitsun, and will be available for return any day of sailing up to fourteen days. St. Malo is an excellent centre for the many quiet, pretty watering-places and the quaint inland villages of beautiful Brittany. There will also be similar bookings, at the same fare, to Havre, from which Etretat, Trouville, Honfleur, and other noted resorts in picturesque Normandy are easily accessible. A feature in connection with the availability of these tickets is the alternative of returning from either St. Malo, Havre, Granville, or Cherbourg plus fare between ports. Another attractive excursion is from Waterloo to Southampton, thence across the Channel to Havre, and from Havre to Rouen by steamer up the river Seine, passing through some of the most beautiful parts of the lovely Seine Valley. The inclusive return fare, Waterloo to Rouen, is 28*s.* 6*d.*, and the tickets will be issued on the Friday and Saturday before the holiday. Holders of fourteen-day excursion tickets to Paris, fare 26*s.*, can break their journey at Havre or Rouen, either going or returning. Other favourite objectives at this time of the year are the well-known holiday grounds of Devon and Cornwall, to which the London and South-Western Railway Co. is running fast excursions from London (Waterloo) on the Friday night and Saturday morning, including Ilfracombe, Bude, Padstow, Exeter, Dartmoor, Plymouth, Exmouth, &c. There will also be the usual bookings to the Isle of Wight, Southsea, New Forest, Bournemouth, Swanage, Weymouth, Sidmouth, and other places in the Sunny South and South-West. Tourist and week-end tickets (all classes) will be issued by the corridor, luncheon, and dining-car trains to the South and West of England. To insure comfort en route most of the principal expresses will be duplicated on the few days before the holiday. Full details of cheap facilities, &c., are given in the company's holiday programme, obtainable at their stations and offices, or from Mr. Henry Holmes, superintendent of the line, Waterloo Station, S.E.

THE
Architect and Contract Reporter.
FRIDAY, MAY 20, 1910.

*Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices, 6-11 Imperial Buildings, Ludgate Circus, London, England.*

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*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-ON-MERSEY.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

EDINBURGH.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.

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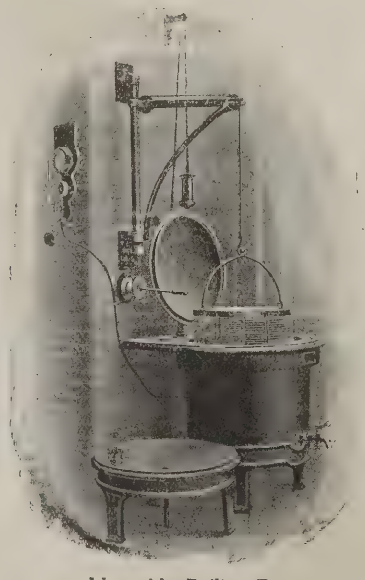
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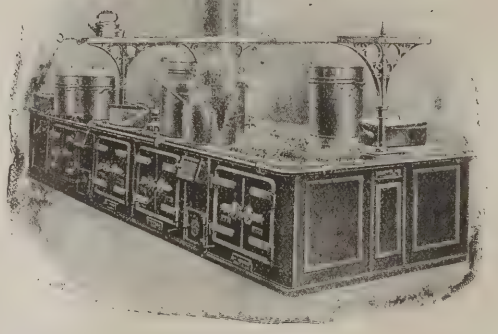
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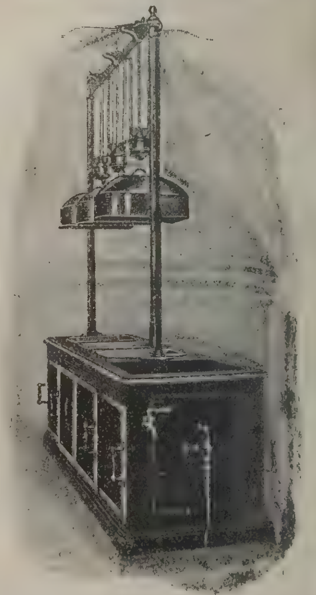
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## CONTRACTS OPEN.

BARNSLEY.—May 31.—For erection and completion of new wards, to accommodate thirty-eight beds, a new block for kitchens, and offices connected therewith, new sterilising and store-rooms, new electric lift, and reconstruction of corridors and renovations to central block, at the Beckett Hospital. Deposit 3*l*. 3*s*. Messrs. G. Moxon & Son, architects, Central Chambers, 26 Church Street, Barnsley.

BOOTLE.—May 23.—For construction of a brick boundary wall at the Cemetery. Borough Engineer, Bootle, Lancs.

BRADFORD. For the several works required in erection of a new hall and alterations to Prospect Wesleyan chapel. Messrs. W. J. Morley & Sons, architects, 269 Swan Arcade, Bradford.

BRADFORD.—May 28.—For erection of Sunday schools and assembly hall for the St. Columba's parish. Messrs. T. H. & F. Healey, architects, 42 Tyrrel Street, Bradford.

BRADFORD.—June 3.—For the erection of the superstructure (masonry, brickwork and 100 tons steelwork), of the sludge disposal works at Strongford. Deposit 3*l*. 3*s*. Mr. J. Garfield, A.M.Inst.C.E., Esholt Hall, Shipley.

BRISTOL.—May 24.—For the reconstruction of the roof and alterations to an engine-shed at Bristol for the Great Western Railway. The Engineer, Bristol Station, Bristol.

BROADSTAIRS.—For erection of a seven-roomed cottage. No quantities supplied. Mr. James Thompson, architect, Preston Road, Westcliff-on-Sea.

BOLSOVER.—For erection of shop at Bolsover and pair of bungalows at Calow. Mr. W. H. Wagstaff, C.E., architect and surveyor, Chesterfield.

DALTON.—May 23.—For erection of additions to store for the Nettleton Co-operative Society, Ltd. Mr. J. Berry, architect and surveyor, 3 Market Place, Huddersfield.

DEAL.—June 4.—For alterations and additions to the Wesleyan day schools, Union Street. Mr. Ernest W. May, architect, Walmer, or at Lloyd's Agency, opposite Deal Pier.

DEVIZES.—May 26.—For erection of eight new almshouses and caretaker's quarters, adjoining Victoria Road, for the trustees of St. Mary's Church and Poor Lands Charity. Mr. A. J. Randell, architect, Exchange Place, Devizes.

DUNSTABLE.—June 15.—For erection of a Council school at Dunstable. Send 1*l*. 1*s*. deposit by May 30 to Messrs. Gotch & Saunders, architects, Kettering.

GATESHEAD.—June 6.—For erecting four cottages for children at Shotley Bridge, for the Union. Send names by May 19 to Mr. G. Graighill, Union Clerk, Poor Law Union Offices, Gateshead.

CHELMSFORD.—May 30.—For additions and alterations to school premises at the King Edward VI. Grammar School. Deposit 5*l*. Quantities will not be supplied. Messrs. Charles & W. H. Pertwee, architects, Chelmsford.

GLASGOW.—May 21.—For the building of boiler seating and flues for one Yorkshire boiler at Belvidere sanitary washhouse, London Road. Mr. Peter Fyfe, chief sanitary inspector, 23 Montrose Street, Glasgow.

GRANGE.—May 23.—For the erection of new premises, for the Bank of Liverpool, Ltd., Grange, Lancs. Mr. John F. Curwen, F.R.I.B.A., F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

GRAYS.—May 20.—For erection of new headquarters, sergeant-instructor's quarters, stores, gun-shed, harness room, &c., for the 3rd Essex Battery, Royal Field Artillery, at Grays. Send 2*l*. 2*s*. deposit to Colonel F. F. Johnson, C.B., secretary, Territorial Force Association, Essex County, Bank Chambers, Chelmsford.

HALIFAX.—May 24.—For the various works required in connection with erection of business premises on the Wards End Estate. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HARTFIELD.—May 21.—For erection of a new class room, &c., at the Hartfield Voluntary schools. Mr. H. C. Nightingale, architect, 2 Judges Terrace, East Grinstead.

HULL.—May 25.—For the construction of a removable pitch pine dancing floor, about 120 feet by 50 feet, for the large hall at Beverley Road baths. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

IPSWICH.—For repairing three cottages in Lady Lane. Apply to Messrs. Saxton & Co., Handford Road, Ipswich.

IRELAND.—May 25.—For extensive alterations to Rossorry church, Clogher, consisting of transept screen, new pews, pulpit, reading desk, arcading to chancel, tiling aisles, &c. Rev. I. H. Pratt, Rossorry Glebe, Enniskillen.

IRELAND.—May 25.—For the erection of the new Devenish school, Monea. Mr. Thomas Elliott, 37 Darling Street, Enniskillen.

IRELAND.—May 25.—For the erection of six labourers' cottages at Killencarrig and ten at Rathdown Upper, for Rathdown No. 2 Rural District Council. Mr. Patrick Cunniam, clerk, Loughlinstown.

IRELAND.—June 4.—For (*a*) general contractors' work; (*b*) shop fitting; (*c*) electric installation; (*d*) decoration of 67 Sackville Street, Dublin. Mr. George T. Moore, A.R.C.S.I., M.Inst.C.E.I., 1 and 2 Foster Place, Dublin.

JUMP.—May 21.—For erection of six houses at Jump, Yorks. Apply by May 21 to Mr. J. Robinson, architect and surveyor, Wombwell.

LEADGATE.—May 23.—For the works required in additions to the Presbytery at the Brooms, Leadgate, Durham. Mr. G. T. Wilson, architect, Blackhill.

LIVERPOOL.—May 25.—For erection and completion of a hospital at Alder Hey, West Derby, for the Guardians. Deposit 5*l*. 5*s*. Mr. Harris P. Cleaver, Union clerk, Brougham Terrace, West Derby Road, Liverpool.

LONDON.—May 24.—For the reconstruction of the convenience in Byward Street, E.C., for the Corporation. Deposit 2*l*. 2*s*. The Office of the Engineer, Guildhall, E.C.

LONDON.—May 31.—For the construction of about 1,564 feet of 3 feet 6 inches brick and concrete culvert in Hither Green Lane and Verdant Lane, Lewisham. Payment 5*s*. Surveyor's Department, the Town Hall, Catford.

LONDON.—May 31.—For small additions and alterations and general repairs at Crosslands and Lindens, 218 and 220 London Road, Croydon. Deposit 5*l*. 5*s*. Mr. Henry Berney, architect, 104 George Street, Croydon.

LOW ROW (CUMBERLAND).—May 27.—For the various works required in erection and completion of a dwelling house. Mr. Thos. Ridley, grocer, &c., Low Row, Cumberland.

LYMINGE.—May 25.—For erection of four cottages at the Workhouse, Lyminge, for the Guardians of Elham Union. Mr. R. Lonergan, clerk, 29 Bouverie Square, Folkestone.

NEWARK.—May 23.—For erection of five almshouses, off Hospital Lane. Messrs. Sheppard & Lockton, architects, Bargate, Newark.

PINXTON (ALFRETON).—May 30.—For erection of four cottages for the Pinxton Co-operative Society, Ltd. Deposit 1*l*. 1*s*. Mr. John Tomlinson, architect, South Normanton.

ST. CLEMENT'S.—May 23.—For erection and completion of two dwelling-houses at St. Clement's, near Truro. Mr. A. Ernest Harris, architect, 28 Boscawen Street, Truro.

SCOTLAND.—May 28.—For the mason, carpenter, slater, plaster, and painter works in connection with the reconstruction of Glengairn schoolhouse. Mr. John Beaton, clerk to the Glengairn School Board, Ballater.

SEDBERGH.—May 27.—For erecting additions to Beansmoor, Sedbergh. Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

SKERNE.—May 28.—For alterations and additions to the house and buildings at Nicholson's Farm, Skerne, Yorks. Mr. John Bickersteth, clerk, County Hall, Beverley.

STANLEY.—For proposed alterations and additions to premises in Front Street, Stanley, Durham, for the West Stanley Co-operative Society, Ltd. Mr. William Forster, architect, Front Street, Stanley.

TORQUAY.—May 24.—For erection of a pavilion. Send 3*l*. 3*s*. deposit by May 24 to Mr. Fredk. S. Hex, town clerk, Town Hall, Torquay.

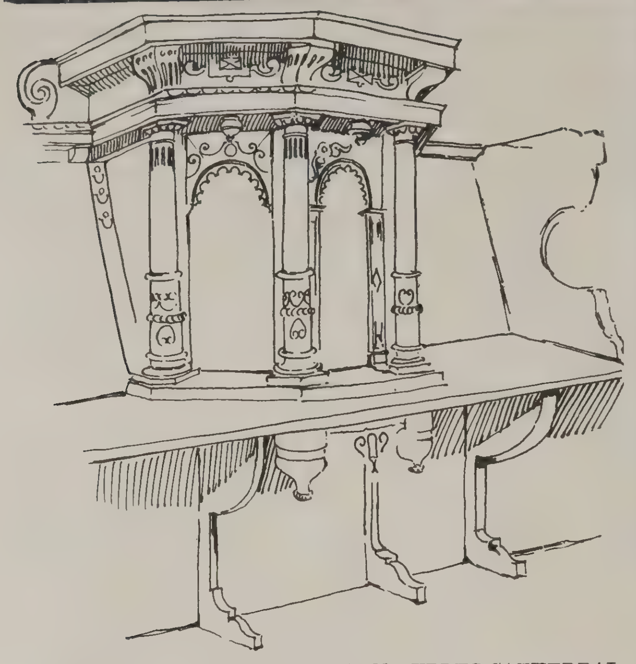
WADDON (CROYDON).— May 25.—For the builders' work necessary in erection of two isolation pavilions and additions to borough hospital administrative block, &c., for the Croydon Town Council. Deposit 1*l*. 1*s*. The Borough Engineer, Town Hall, Croydon.

WALES.—For erection of ten or more of two classes of semi-detached cottages, for the Goitre Building Club, in the new garden city suburb, Merthyr Tydfil. Mr. John Mann, jun., architect and surveyor, 27 Lancaster Villas, Merthyr Tydfil.

WALES.—May 25.—For contract No. 2, erection of attendant's cottage and valve chamber at Lavernock, for the Cardiff Corporation. Deposit 2*l*. City Engineer's Office, City Hall, Cardiff.

WALES.—May 26.—For the erection of a Council school for mixed and infants, at Ty'r Graig, Aberbeeg, Abertillery. Deposit 2*l*. 2*s*. Messrs. Speir & Bevan, Borough Chambers, Wharton Street, Cardiff.

WALES.—May 27.—For enlarging the free library at Felinfoel, Llanelly. Mr. Wm. Griffiths, F.S.I., architect, Falcon Chambers, Llanelly.



BISHOP'S PULPIT IN CHOIR (1598), YPRES CATHEDRAL.

From a Sketch by BANISTER FLETCHER.

WALES.—May 28.—For erection of twenty-four houses at Argoed, Mon., for the Argoed Workmen's Building Club. Mr. A. F. Webb, architect and surveyor, Blackwood and Tredegar.

WALES.—May 28.—For work of alterations to windows and floors of Treharris boys' and infants' schools, Merthyr Tydfil. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

WALES.—June 7.—For the erection of a new goods shed, stable, &c., at Duffryn Sidings, Caerau, Glamorganshire, for the Great Western Railway. The Engineer, Newport Station, Mon.

WALES.—June 8.—For erection of a Council school building at Lamphey, near Pembroke. Deposit 1l. 1s. Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALTON.—May 27.—The West Riding Education Committee invite tenders for the following work:—Walton new Council school (builder, joiner, slater, plumber, plasterer, and painter). Deposit 1l. with the Treasurer. The Education Architect, County Hall, Wakefield.

WARWICK.—June 7.—For alteration of the premises acquired at the Aston Lower Grounds to fit the same for the requirements of the Territorial units. Deposit 3l. 3s. Messrs. James & Lister Lea & Sons, architects, 19 Cannon Street, Birmingham.

WATERLOO.—June 20.—For the erection of the Crosby Road North Council School, Waterloo, near Liverpool. Deposit 1l. 1s. Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

YORKS.—May 27.—The West Riding education committee invite whole or separate tenders for the following works for Walton Council school, viz.:—Builder, joiner, slater, plumber, plasterer, painter. Deposit 1l. The Education Architect, County Hall, Wakefield.

YORKS.—June 10.—The West Riding education committee invite whole or separate tenders for the following works, viz.: Bradfield, Stannington Council school; Swinton, Roman Terrace Council school, alterations and additions; Stainland-with-Old-Lindley, Bowling Green Council school, new woodwork centre (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1l. deposit in each case to the West Riding Treasurer, County Hall, Wakefield.

WE have been requested by the Secretary of the Society of Engineers (Incorporated), 17 Victoria Street, S.W., to remind our readers that the last date on which essays in competition for the Status prize can be received is Tuesday, May 31, 1910.

THE Glasgow Corporation have appointed a special committee to consider and report as to what steps should be taken to secure that the measurement work of the various municipal departments is allocated on an equitable basis among the members of the Institute of Measurers in practice in the city.

# TENDERS.

## BEACONSFIELD.

For the erection of two houses in Burkes Road and two in Furzefield Road. Messrs. JOHNSON & BODDY, architects, Beaconsfield and Gerrard's Cross.

| | | | |
|---|---|---|---|
| Crabb & Co. | £4,087 | 0 | 0 |
| Bailey | 3,496 | 0 | 0 |
| Froude | 3,373 | 0 | 0 |
| Carrick & Son | 3,330 | 0 | 0 |
| Falkner & Sons | 3,319 | 0 | 0 |
| Gibbings & Co. | 3,260 | 0 | 0 |
| Acock | 3,173 | 0 | 0 |
| Hanson | 3,150 | 0 | 0 |
| LOVELL & SON, Gerrard's Cross and Marlow (*accepted*) | 3,135 | 0 | 0 |

## BELVEDERE.

For the erection of two additional wards and other extensions to the Erith Sanatorium, Little Heath. Mr. H. HIND, surveyor, Erith.

| | | | |
|---|---|---|---|
| F. & G. Foster | £1,581 | 0 | 0 |
| Blake | 1,549 | 0 | 0 |
| R. & J. Butler | 1,546 | 0 | 0 |
| Kirk & Randall | 1,529 | 0 | 0 |
| Thomas & Edge | 1,510 | 0 | 0 |
| Ellingham | 1,467 | 0 | 0 |
| Milton | 1,450 | 0 | 0 |
| Pasterfield & English | 1,447 | 0 | 0 |
| Shumur & Sons | 1,440 | 0 | 0 |
| Pavitt & Sons | 1,437 | 0 | 0 |
| Jarvis & Son | 1,415 | 0 | 0 |
| Woollaston & Co. | 1,350 | 0 | 0 |
| Friday & Ling | 1,335 | 0 | 0 |
| GUNNING & SON, Erith (*accepted*) | 1,298 | 19 | 0 |

## BIRMINGHAM.

For the erection of a fire station in Moseley Road, Highgate. Messrs. ARTHUR HARRISON & COX, architects, 109 Colmore Row, Birmingham. Quantities by Messrs. MANSELL & MANSELL, Birmingham.

| | | | |
|---|---|---|---|
| Dallow & Sons (*recommended*) | £10,798 | 0 | 0 |

There were eighteen tenders.

## BROMSGROVE.

For the erection of a Secondary school for the Worcestershire education committee.

| | | | |
|---|---|---|---|
| Tilt | £6,997 | 0 | 0 |
| Dallow | 6,979 | 0 | 0 |

## BURY ST. EDMUNDS.

For erection of the new Rod Bridge, with road, for the West Suffolk County Council.

| | | | |
|---|---|---|---|
| Higgs & Hill | £1,974 | 0 | 0 |
| Yorkshire Hennebique Co. | 1,116 | 2 | 3 |
| HOLLOWAY BROS., Lambeth (*accepted*) | 1,100 | 0 | 0 |

## GOODMAYES.

For alterations and additions, Little Heath House, Goodmayes Asylum, for the West Ham Town Council. Mr JOHN G. MORLEY, borough engineer.

| | | | |
|---|---|---|---|
| Luton | £4,670 | 0 | |
| Webb | 4,555 | 0 | |
| Strong & Co. | 4,549 | 0 | |
| Houghton | 4,533 | 0 | |
| Brown | 4,345 | 0 | |
| Leslie & Co. | 4,293 | 0 | |
| Maddison | 3,941 | 0 | |
| F. & G. Foster | 3,887 | 0 | |
| Nightingale | 3,803 | 0 | |
| Moss | 3,800 | 0 | |
| Woollaston & Co. | 3,780 | 0 | |
| Jerram | 3,778 | 0 | |
| North Bros. | 3,765 | 0 | |
| Roberts & Co. | 3,721 | 0 | |
| Myal & Upson | 3,700 | 0 | |
| Horswill | 3,700 | 0 | |
| SYMES, Stratford (*accepted*) | 3,444 | 0 | |

## HAIL WESTON (HUNTS.).

For alterations to the Crown Inn, for Messrs. Charles Wells Ltd., Bedford. Mr. T. COCKRILL, A.M.Inst.C.E., architect, Biggleswade.

| | | |
|---|---|---|
| Wellham | £204 | 7 |
| Wade | 198 | 16 |
| WRYCROFT & SONS, St. Neots (*accepted*) | 185 | 0 |

### HALE.

For the making-up of Alan Drive, Hale, Cheshire. Mr. S. A. Pickering, surveyor.

| | | | |
|---|---|---|---|
| Exor. of T. Barber | £882 | 6 | 0 |
| Watson, jun. | 851 | 18 | 6 |
| Hamilton & Son | 844 | 0 | 0 |
| Snape & Sons | 720 | 16 | 11 |
| Bozson, jun. | 720 | 0 | 0 |
| Clegg | 692 | 17 | 2 |
| Worthington | 675 | 4 | 10 |
| Sheeren | 664 | 4 | 6 |
| Bethell & Sons, Sale (*accepted*) | 654 | 2 | 2 |
| Woodfine | 649 | 18 | 8 |

### HANDSWORTH.

For erecting a mess room, cottage, &c., at the Cemetery, Camp Lane, Handsworth, Staffs, for the Urban District Council. Mr. H. Richardson, A.M.I.C.E., engineer and surveyor.

| | | | |
|---|---|---|---|
| Wallis | £1,480 | 0 | 0 |
| Jackson | 1,220 | 0 | 0 |
| Darby & Son | 1,170 | 10 | 0 |
| Garfield | 1,154 | 0 | 0 |
| Banner | 1,125 | 0 | 0 |
| Bishop | 1,077 | 0 | 0 |
| Hassall | 1,075 | 0 | 0 |
| Gregory | 1,070 | 0 | 0 |
| Dallow & Sons | 1,070 | 0 | 0 |
| Hulbert & Ladbury | 1,052 | 16 | 10 |
| Cooper | 1,013 | 12 | 9 |
| Harris & Son | 1,000 | 0 | 0 |
| Waterman, jun. | 963 | 0 | 0 |
| Cox, Handsworth (*accepted*) | 957 | 0 | 0 |

### LANCHESTER.

For construction of a sewer at Maiden Law, for the Lanchester Joint Hospital Board.

| | | | |
|---|---|---|---|
| Gunter & Sons | £276 | 0 | 0 |
| Henderson | 243 | 18 | 10 |
| Ward | 239 | 0 | 0 |
| Bunch | 236 | 10 | 10 |
| Johnson & Strachan | 225 | 1 | 6 |
| Gallagher | 221 | 17 | 0 |
| Usher & Co., Newcastle (*accepted*) | 211 | 2 | 3 |

### LONDON.

For the execution of certain works of kerbing, channelling, metalling, paving, surface water drainage, and other works in Victoria Road, Mill Hill, N.W., for the Hendon Urban District Council. Mr. S. Slater Grimley, engineer.

| | | | |
|---|---|---|---|
| Griffiths & Co. | £1,910 | 17 | 5 |
| Paterson | 1,841 | 7 | 11 |
| Mowlem & Co. | 1,813 | 0 | 0 |
| Hamiltons | 1,809 | 11 | 3 |
| Adams | 1,794 | 1 | 2 |
| Wickerstead & Co. | 1,753 | 14 | 6 |
| Ballard | 1,749 | 0 | 0 |
| Powdrill, Luton (*accepted*) | 1,658 | 7 | 9 |

For painting the exterior of Park Buildings, for the Bermondsey Borough Council.

| | | | |
|---|---|---|---|
| Emmett | £333 | 17 | 6 |
| Stuart & Sons | 225 | 0 | 0 |
| White & Co. | 169 | 5 | 0 |
| Borough Surveyor | 169 | 6 | 6 |
| Greenwood | 157 | 15 | 0 |
| Durrant & Sons, Rotherhithe Street (*accepted*) | 135 | 10 | 0 |

For converting the Yorkshire Stingo Brewery, 187 Marylebone Road, N.W., into a Church Army labour home. Mr. G. A. Lansdown, F.R.I.B.A., architect; 9 Regent Street, S.W.

| | | | |
|---|---|---|---|
| Toten & Willett | £11,215 | 10 | 0 |
| Parker & Sons | 11,195 | 0 | 0 |
| Williams | 10,460 | 0 | 0 |
| F. & H. F. Higgs | 10,380 | 0 | 0 |
| Higgs & Hill | 9,980 | 0 | 0 |
| Carmichael | 9,760 | 0 | 0 |
| Marsland & Sons | 9,750 | 0 | 0 |
| Hall, Beddall & Co. | 9,733 | 0 | 0 |
| Johnson & Co. | 9,570 | 0 | 0 |
| H. & E. Lea | 9,555 | 0 | 0 |
| Patman & Fotheringham (*accepted*) | 9,443 | 0 | 0 |

### LONDON—*continued.*

For the erection of a police section house at Paddenswick Road, Hammersmith. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard.

| | | | |
|---|---|---|---|
| Spencer, Santo & Co. | £13,964 | 0 | 0 |
| Foster & Dicksee | 13,555 | 0 | 0 |
| Holloway Bros. | 13,480 | 0 | 0 |
| Ashby & Horner | 13,470 | 0 | 0 |
| Appleby & Sons | 13,280 | 0 | 0 |
| Pattinson & Sons | 13,183 | 0 | 0 |
| King & Son | 13,100 | 0 | 0 |
| F. & H. F. Higgs | 13,030 | 0 | 0 |
| Jarvis & Sons | 12,988 | 0 | 0 |
| Higgs & Hill | 12,984 | 0 | 0 |
| Mowlem & Co. | 12,971 | 0 | 0 |
| Galbraith Bros. | 12,882 | 0 | 0 |
| Lole & Co. | 12,828 | 0 | 0 |
| Prestige & Co. | 12,787 | 0 | 0 |
| Sabey & Son | 12,723 | 0 | 0 |
| Holliday & Greenwood | 12,720 | 0 | 0 |
| Killby & Gayford | 12,700 | 0 | 0 |
| Fairhead & Sons | 12,662 | 0 | 0 |
| Godson & Sons | 12,555 | 0 | 0 |
| Fryer & Co. | 12,540 | 0 | 0 |
| Minter | 12,449 | 0 | 0 |
| Lovatt | 12,432 | 7 | 1 |
| Grover & Son | 12,419 | 0 | 0 |
| Patman & Fotheringham | 12,383 | 0 | 0 |

### LOUTH.

For the rebuilding of the Golden Lion Inn at Fishtoft and the Crown Inn at Saltfleet. Mr. R. H. Fowler, architect, Louth.

*Fishtoft.*

| | | | |
|---|---|---|---|
| Lettice Bros. | £730 | 0 | 0 |
| Arundel | 695 | 5 | 8 |
| Watson & Co. | 674 | 9 | 2 |
| Vickers | 595 | 10 | 0 |
| Barber | 587 | 6 | 6 |
| Parker & Son | 584 | 0 | 0 |
| Pett | 577 | 0 | 0 |
| Lucas & Son (*accepted*) | 560 | 0 | 0 |

*Saltfleet.*

| | | | |
|---|---|---|---|
| Thompson & Son | 643 | 17 | 0 |
| Arundel | 604 | 4 | 2 |
| Mawer Bros. | 599 | 0 | 0 |
| Parker & Son | 589 | 0 | 0 |
| Vickers (*accepted*) | 585 | 0 | 0 |

### NAFFERTON.

For erecting six cottages. Mr. J. Shepherdson, architect, South Driffield.

| | | | |
|---|---|---|---|
| Hoggard | £1,086 | 0 | 0 |
| Sanderson | 1,020 | 0 | 0 |
| Leason & Son | 825 | 0 | 0 |
| Berry, Nafferton (*accepted*) | 767 | 0 | 0 |

### NORTH SHIELDS.

For erection of the Boro' Theatre, for Exors. G. Black. Messrs. H. Gibson & P. J. Stienlet, architects, North Shields.

| | | | |
|---|---|---|---|
| Robertson | £4,488 | 8 | 8 |
| Sheriff | 4,000 | 0 | 0 |
| Middlemiss Bros. | 3,930 | 12 | 7 |
| Park | 3,879 | 13 | 6 |
| George | 3,377 | 0 | 0 |
| Craven | 3,815 | 15 | 2 |
| Townson & Son | 3,920 | 0 | 0 |
| R. F. Construction Co. | 3,766 | 3 | 8 |
| Shepherd | 3,889 | 19 | 5 |
| Newbold | 3,743 | 7 | 6 |
| Weir, Howdon (*accepted*) | 3,700 | 0 | 0 |
| Fenwick & Co. | 3,630 | 0 | 0 |

### SOUTHAMPTON.

For converting No. 34 London Road, into business premises. Mr. William Burrough Hill, F.S.I., architect, Southampton.

| | | | |
|---|---|---|---|
| Playfair & Toole | £580 | 0 | 0 |
| Udall & Co. | 580 | 0 | 0 |
| Stevens & Co. | 555 | 0 | 0 |
| Jenkins & Sons | 519 | 0 | 0 |
| Cawte | 513 | 0 | 0 |
| Wright & Son, Southampton (*accepted*) | 499 | 0 | 0 |

## SCOTLAND.

For the excavating, laying, and jointing of 2¼ miles of 8-inch and 6-inch diameter cast-iron pipes, for the Bo'ness Town Council. Mr. JOHN LOUDEN, burgh surveyor.

*Excavating and pipe-laying.*

| | | | |
|---|---|---|---|
| Stark & Dobbie | £753 | 14 | 9 |
| Dobson | 694 | 12 | 8 |
| Grant & Son | 671 | 15 | 9 |
| McAndrew | 635 | 15 | 6 |
| Flett | 630 | 0 | 0 |
| Bremner | 629 | 16 | 10 |
| Peattie & Wilson | 577 | 16 | 4 |
| McKenacher | 568 | 15 | 0 |
| Ritchie | 555 | 9 | 2 |
| Jipps & Sneddon | 542 | 4 | 8 |
| Crawford | 523 | 1 | 3 |
| Gibson | 490 | 18 | 8 |
| Pollock | 488 | 10 | 6 |
| Graham | 480 | 13 | 8 |
| BAIKIE & SELLAR, Bo'ness (*accepted*) | 426 | 4 | 9 |

*Pipes.*

| | | | |
|---|---|---|---|
| Laidlaw & Son | 1,362 | 8 | 4 |
| Stewart & Co. | 1,351 | 3 | 1 |
| Macfarlane, Strang & Co. | 1,313 | 6 | 3 |
| MACLAREN & Co., Glasgow (*accepted*) | 1,307 | 2 | 2 |

## TREVONE.

For water supply works for St. Columb Major Rural District Council. Mr. G. A. EVANSON, engineer, St. Austell.

| | | | |
|---|---|---|---|
| Lister | £1,030 | 0 | 0 |
| Jacob | 629 | 10 | 6 |
| Shaddock | 627 | 0 | 0 |
| Derry | 568 | 0 | 0 |
| Bennett | 550 | 0 | 0 |
| BROWN BROS., Wadebridge (*accepted*) | 539 | 0 | 0 |

## WALES.

For alterations, additions, and renovations to Tabernacle Chapel, Pontypridd. Messrs. A. O. EVANS, WILLIAMS & EVANS, architects, Pontypridd.

| | | | |
|---|---|---|---|
| Knox & Wells | £2,970 | 0 | 0 |
| Davies & Son | 2,850 | 0 | 0 |
| Griffiths | 2,807 | 3 | 7 |
| Davies | 2,731 | 5 | 8 |
| Williams & James | 2,686 | 0 | 0 |
| Julian | 2,647 | 0 | 0 |
| Evans | 2,616 | 18 | 10 |
| Colburn | 2,576 | 19 | 0 |
| Jones Bros. | 2,560 | 0 | 0 |
| Turner & Son | 2,528 | 0 | 0 |
| Jones & Sons | 2,500 | 0 | 0 |
| JONES & SON, Pontypridd (*accepted*) | 2,412 | 3 | 0 |

For alterations and additions to Trallwn Bakery, Trallwn, Pontypridd. Messrs. A. O. EVANS, WILLIAMS & EVANS, architects, Pontypridd.

| | | | |
|---|---|---|---|
| Griffiths | £3,089 | 6 | 6 |
| Davies & Sons | 2,704 | 0 | 0 |
| Evans & Bros. | 2,699 | 0 | 0 |
| Davies | 2,640 | 0 | 0 |
| Jones Bros. | 2,620 | 0 | 0 |
| Williams & James | 2,599 | 15 | 0 |
| Colborne | 2,599 | 10 | 0 |
| Jones & Son | 2,587 | 0 | 0 |
| Evans | 2,578 | 0 | 0 |
| Jones | 2,577 | 10 | 0 |
| Julian | 2,468 | 0 | 0 |
| Niblett & Davies | 2,418 | 0 | 0 |
| KNOX & WELLS, Cardiff (*accepted*) | 2,367 | 0 | 0 |

For the construction of sewers for the drainage of Hafodyrynys. Mr. J. WILLIAMS, engineer, Council Offices, Abercarn, Mon.

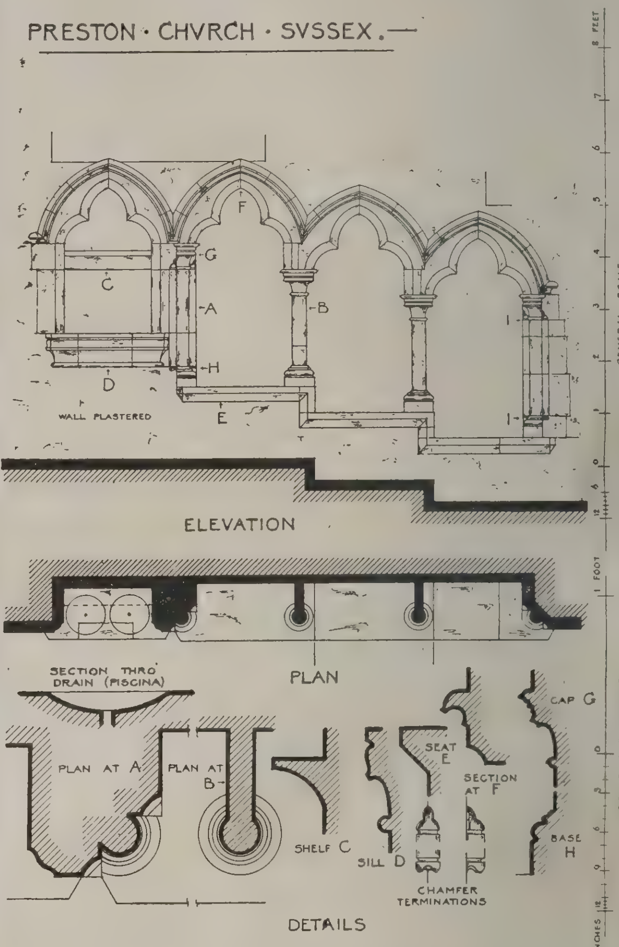
| | | | |
|---|---|---|---|
| Peters | £913 | 0 | 0 |
| Johnston Bros. | 809 | 2 | 0 |
| Jones & Jones | 777 | 5 | 6 |
| Smith | 754 | 9 | 2 |
| R. Jones | 638 | 10 | 0 |
| LEWIS, Aberberg (*accepted*) | 649 | 2 | 6 |
| Davies, Ball & Co. | 501 | 14 | 3 |

MR. JOHN YOUNG, F.R.I.B.A., died on the 15th inst., in his eighty-first year, at Guildford Lodge, Brentford, Essex. Mr. Young was elected an associate of the Royal Institute in 1860, and retired in 1902.

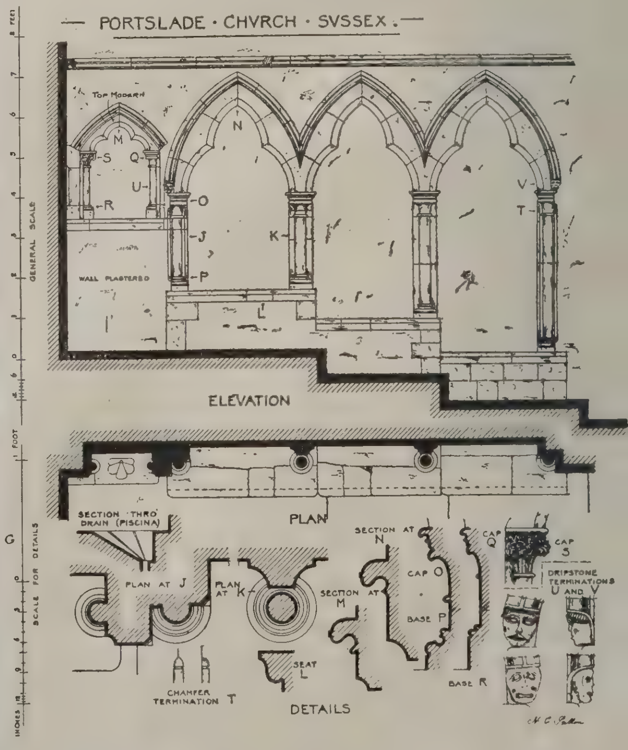
## EARLY ENGLISH PISCINÆ AND SEDILIA.

PRESTON, once a village, now forms part of the northern suburb of Brighton. The church contains much work of interest, and, during its restoration in 1870, on the removal of the whitewash some very fine mural paintings were brought to light.

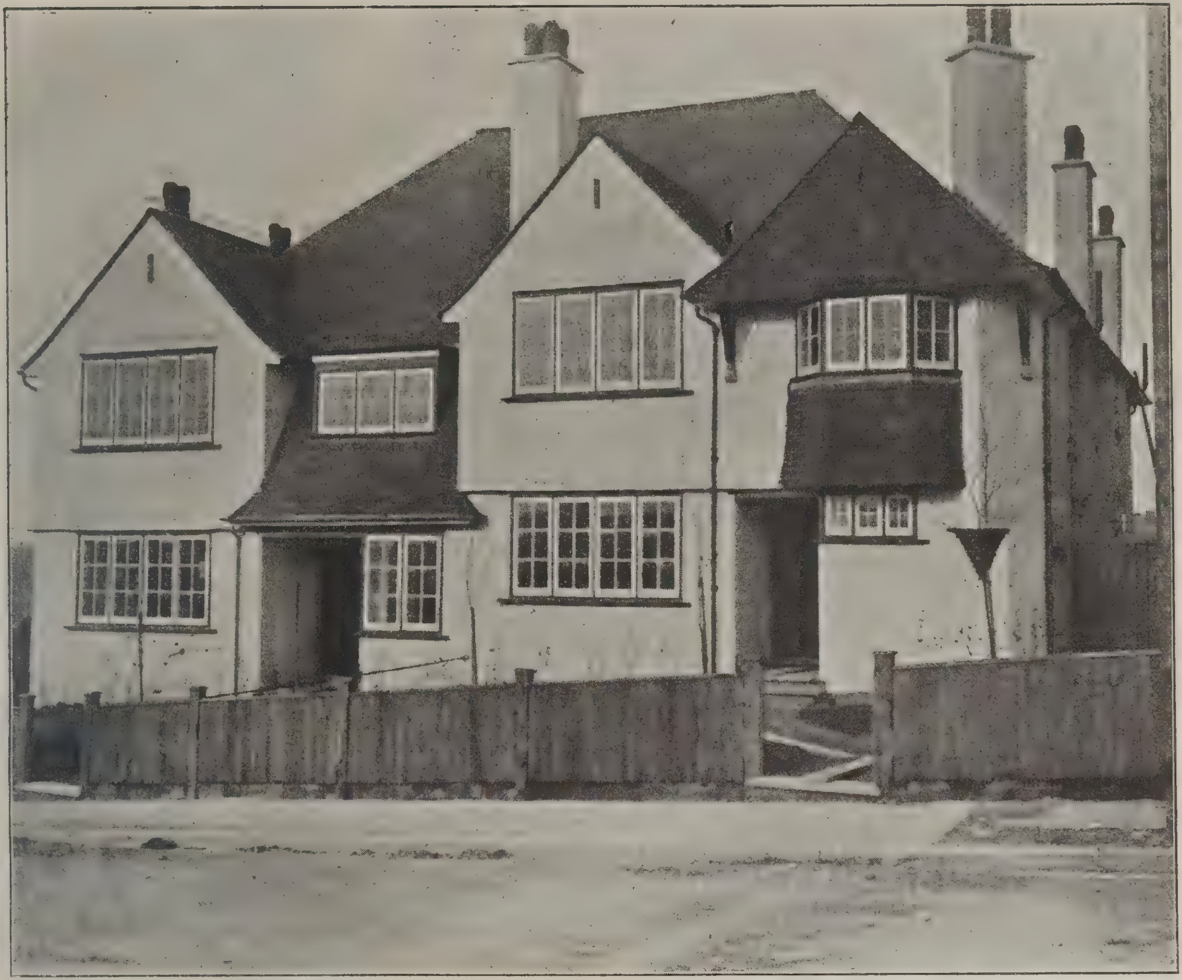
There is a beautiful altar tomb in the chancel, and a curious old font has been preserved.



Portslade lies between Brighton and Shoreham, and its church, with a tower almost entirely hidden by ivy, has a good timber roof covered with large stone slates.



The similarity between the Preston and Portslade sedili will be noticed in the stepping seats, the shafts and the trefoi arches within pointed ones.



HOUSES AT CARSHALTON, SURREY.—Mr. J. Bruce Merson, Architect.

## HOUSES AT CARSHALTON, SURREY.

This pair of semi-detached houses was built last year in Hill Road, Carshalton, Surrey, by the Carshalton District Development Co., Ltd., for whom they were designed by Mr. J. Bruce Merson, architect. As the road is very steep the houses were designed to meet this, and to avoid the ugly break in roof line which the change of level would cause. The walls are built of brick roughcasted outside, the roofs are covered with red tiles and the woodwork of all doors and windows is painted green, while the window sashes are painted a cream colour.

## VARIETIES.

Mr. E. J. Silcock, M.Inst.C.E., F.S.I., 11 Tothill Street, S.W., has arranged to take over the engineering part of the practice carried on by Mr. W. H. Simpson, A.M.Inst.C.E., of Leicester.

Mr. John Wilson, architect, Edinburgh, has been appointed architect to the Scottish Local Government Board under the Town Planning Act. In our issue of last week we stated that the appointment had been given to Mr. John Walker.

New banking premises are about to be erected at Swansea for the London and Provincial Bank, Ltd., the site being opposite their present offices in Wind Street. Mr. Glendinning Moxham, F.R.I.B.A., Swansea, has been appointed their architect to carry out this work.

The Royal Archæological Institute will hold their annual meeting at Oxford from Tuesday, July 19, to Thursday, July 28, with headquarters at the Randolph Hotel. Lord Curzon of Kedleston, Chancellor of the University, has accepted the presidency of the meeting.

According to the *Moniteur des Intérêts Matériels* (Brussels) of May 1, the Roumanian Ministry of Finance at Bucharest will shortly invite tenders for the construction of slaughter-houses at Turu-Severin and Burdujeni. The cost of each abattoir is estimated at 60,000*l*.

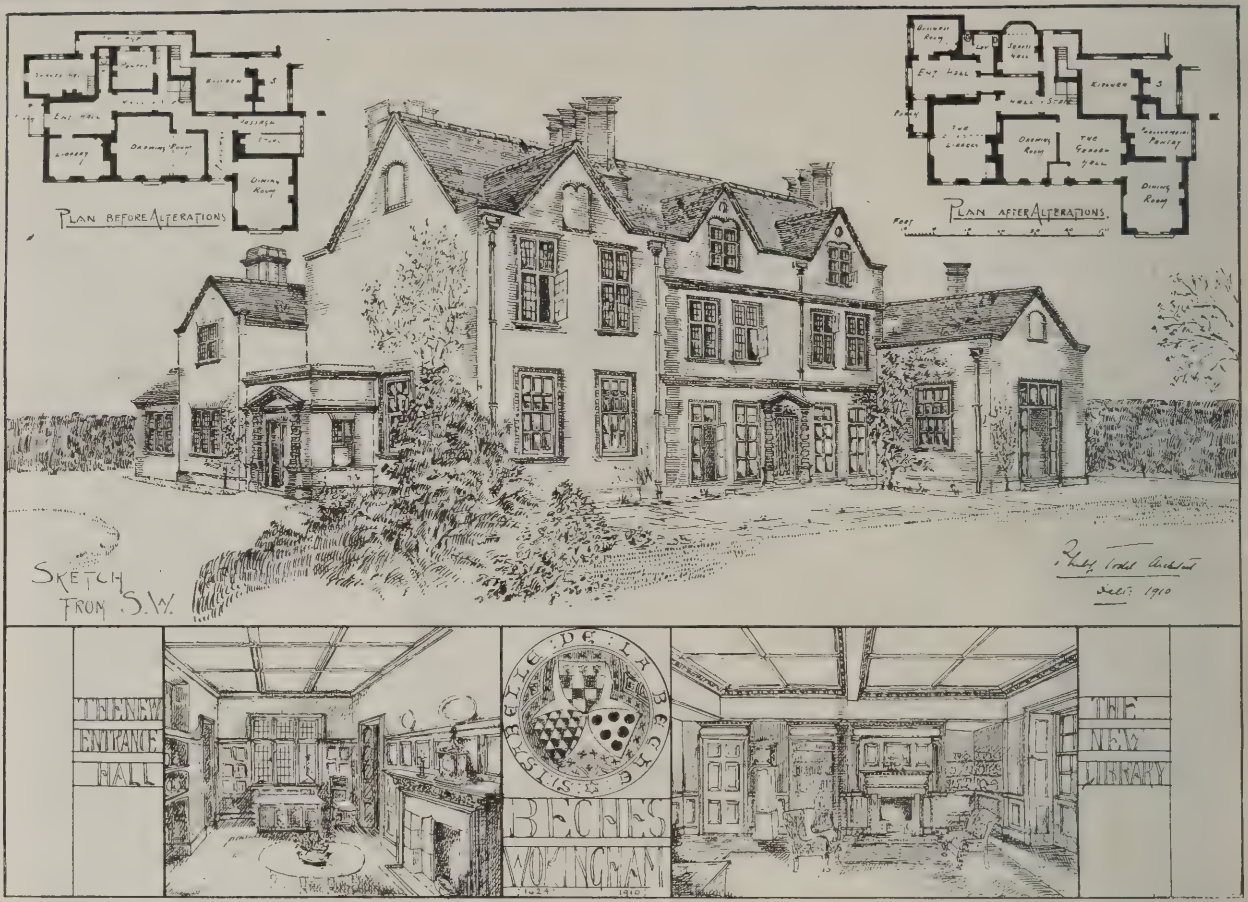
The Cowes Harbour Commissioners have decided to apply to the Board of Trade for sanction to a loan not exceeding 6,000*l*. for the construction of a new breakwater from the esplanade wall in a northerly direction across the Shrape mud bank. The scheme, which will provide further mooring facilities for yachts, has the approval of the Admiralty.

The Cathcart School Board have decided to provide extra school accommodation at Battlefield school. New buildings will be erected to provide 1,200 school places, and Messrs. M'Whannell, Rogerson & Reid, Glasgow, were appointed architects, and Messrs. D. Wilkie & Son, Glasgow, measurers.

Messrs. Easton, Gibb & Co., the Rosyth Naval Base contractors, have placed an order for 1,500,000 tons of sand for their work at Rosyth. The removal of the sand is to go on immediately, and the daily output is to be 200 tons. This contract has been let to Mr. F. G. Yooll, Edinburgh, who has secured permission to remove the sand from the Grangehall Estate, which extends along the shore for over a mile to the west of the town.

The Usher Hall committee, with a view to providing information for the architects sending in competitive plans for the Usher Hall, Edinburgh, have been carrying out boring operations at Grindlay Street. The object is to discover at what depth rock is to be found, and boring was conducted at five different places. A report of the results will be drawn up and issued to the competing architects. It is understood that a good foundation will be got at a depth of 16 feet.

The streets and buildings committee of Edinburgh Town Council last week considered an application from the architect of the new United Free Church offices in George Street for permission to lay granite slabs for the pavement in front of their new buildings. The church authorities in their application made stipulation that they would lay it and maintain it to the satisfaction of the city authorities. By the casting vote of the Convener, the committee, keeping in view the experience of other cities, agreed to recommend that



THE MANOR HOUSE OF BECHES, WOKINGHAM

the request be not granted, the main objection to granite being its slippery surface when it is worn.

The Imperial Trade Correspondent at St. John, New Brunswick, reports to the *Board of Trade Journal* that the Grand Trunk Pacific Railway has purchased 70 acres of land at the head of Courtenay Bay, on which it is proposed to construct large railway terminal facilities. It is expected that tenders will be invited this summer by the Federal Government for the construction of warehouses on the west side of the harbour of St. John. The dredging for another berth is almost completed, and operations will be continued to provide for more wharves. It will be necessary to demolish the present harbour lighthouse beside the channel, and to erect a new one further inshore.

The Glasgow Town Council have adopted a minute of the finance committee recommending the purchase of property in Renfrew, Rose and Dalhousie Streets, adjoining the Corporation premises, now occupied by the Royal Glasgow Institute of Fine Arts. The purchase price is 14,500*l*. The Art Institute at present pay a rental of something like 1,400*l*. for the premises. Their lease would expire in two years, and they practically intimated to the Corporation that unless considerable alteration was made upon the buildings they would be under the necessity of terminating their tenancy. There are heavy insurance risks upon the present premises of the Institute, and many people refused to give loan pictures simply on account of the great danger that existed from an outbreak of fire.

The Glasgow Dean of Guild at their meeting last week, besides passing the lining for the Exhibition buildings in Kelvingrove Park granted the following linings:—The Rev. H. Wallace, Barrachnie, to erect a hall, &c., in connection with the Congregational church in Westmuir Street. The Clyde Football Club, Ltd., Shawfield Park, to erect a grand stand, with dressing rooms, baths, board room, and offices within the ground at Shawfield. The Western Property Company, Ltd., 34 West George Street, to erect four tenements of dwelling houses in York Drive, Hyndland. The School Board of Govan, to erect a school at the junction of Airlie Street and Clarence Drive, Hyndland. David Anderson, spirit merchant, 171 Westmuir Street, to erect a tenement of dwelling houses and shops at the north-east corner of Westmuir Street and Back Causeway.

## BECHES, WOKINGHAM.

This interesting old brick house is described in Lysons's history of Berkshire as the manor-house of the De la Bêche family, hence its name.

The property, with the manor, passed by marriage of the daughter and heiress of Robert de la Bêche to one John Whitelock about 1450.

The central portion of the present house was built in 1624. Additions and alterations have been made at various dates, the position of the entrance altered and passages cut off the old rooms.

The house has recently been restored and remodelled under the superintendence of Mr. Philip Todd, and without disturbance of the external walls a considerable amount of passage room has been converted into useful space and the old rooms restored to their original size.

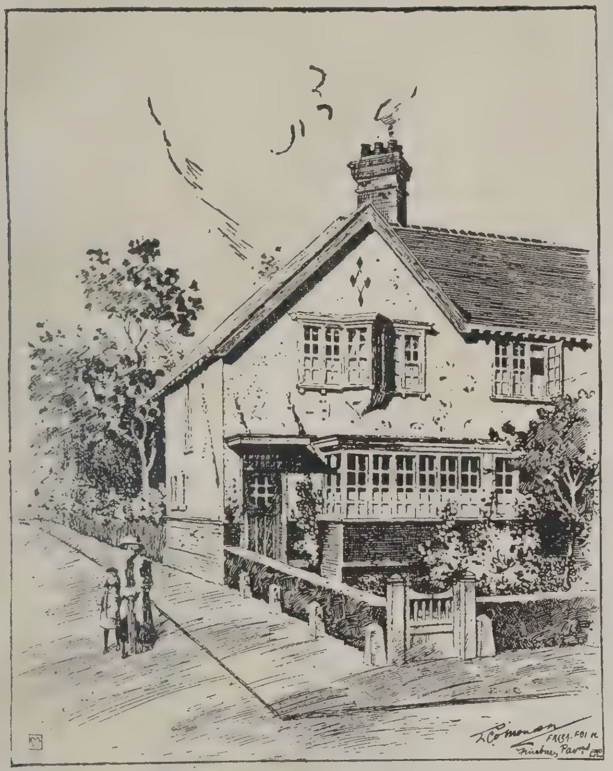
The old front entrance doorway, dated 1624, which was walled up, has been opened out as a garden entrance.

The whole of the works, including oak panelling and decorations, have been executed by Mr. E. C. Hughes, builder, of Wokingham.

## THE MODERN MUNICIPAL COTTAGE.

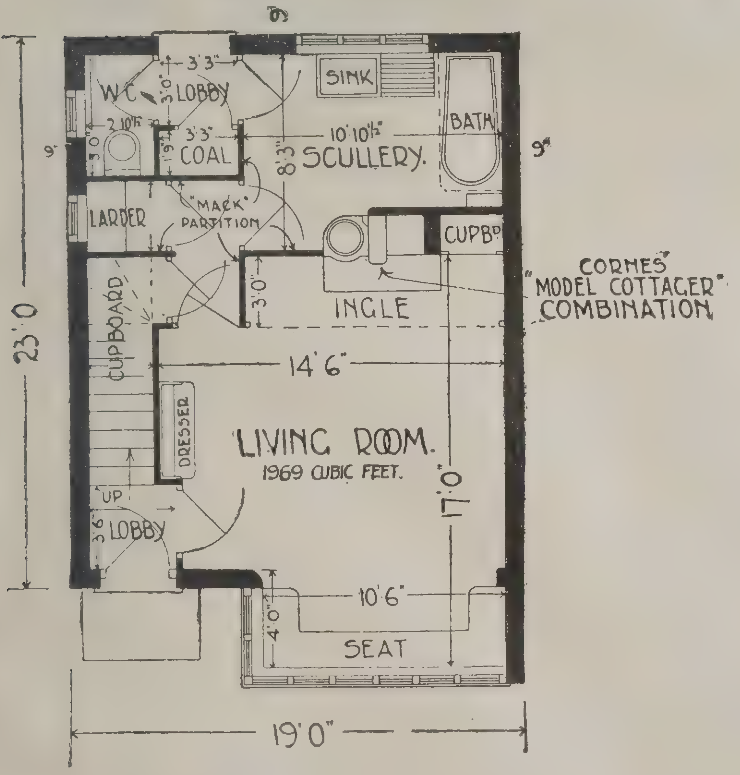
This cottage was specially designed for, and erected at the Second Municipal and Health Exhibition, Royal Agricultural Hall, London. It has been erected by Mr. J. Cornes, author of "Modern Housing in Town and Country," and Mr. J. A. King, the owner of Highams Park Garden Village, as an object lesson in how to obtain a commercial return upon capital invested on the housing of the working classes.

It is estimated to cost from 160*l*. to 175*l*., according to position and facilities for building in the neighbourhood. It can be built in pairs or in blocks of four, with a back entrance opening in the centre, and the design shows the end of a block, or one of a pair. The accommodation provided is:—On the ground floor: Living room, 14 feet 6 inches by 17 feet, = 1,969 cubic feet, measured into the bay window; scullery

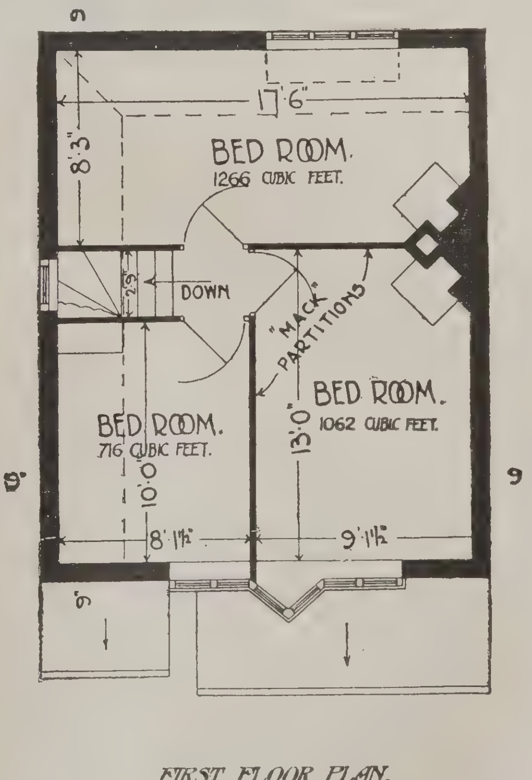


bathroom 11 feet by 8 feet 3 inches, with larder, coal store, w.c. and cupboards, all under the main roof. On the first floor:—Three bedrooms, 13 feet by 9 feet 1½ inches, 17 feet 6 inches by 8 feet 3 inches, 10 feet by 8 feet 1½ inches, = 1,062, 1,266 and 716 cubic feet respectively; the staircase is easy and commodious.

Particular attention is drawn to the large bay window in the living room with its seat, and to the cosy ingle nook in which the fireplace is situated centrally, free from draughts.



*GROUND PLAN*



*FIRST FLOOR PLAN.*

*Scale of feet*

The w.c. or earth closet is reached by an open lobby, which obviates any necessity for occupants going into the wet.

The cottage is fitted with hot and cold water, and a porcelain enamel cast-iron bath, attached to a Cornes model cottager combination kitchener, which is fitted between the kitchen and scullery or bathroom, and economises space, coal and labour. The copper is heated by the kitchen fire. The heat from this fire passes round the radiating front and back of the copper, and the boiler is accessible from the scullery or bathroom. Hot water, which is on the low pressure system, can be drawn in the scullery. One of the salient features of the apparatus is that there is no risk of explosion inasmuch as there is nothing sealed, and the whole fitting can be manipulated with ease and safety. The range has a lifting fire with a specially constructed firebox, with a view to economy of fuel.

The external walls, internal partitions, as well as the ceilings, are fire-resisting and verminproof, built of "Mack" plaster slabs, manufactured solely by J. A. King & Co. ("Mack" fireproofing), 181 Queen Victoria Street, London, E.C., works at Hayes, Middlesex; Rawcliffe, Yorks, &c. They occupy only one-half of the floor space an ordinary brick or lath and plaster partition would, thereby reducing the cubical cost of the buildings and saving considerable frontage where several houses are erected. They have been tested by the British Fire Prevention Committee to a temperature of 2,250° Fahr., with the best result on record. Effect in the treatment of the ceilings is obtained simply by laying the "Mack" slabs on fillets between the joists. The manufacturers supply the "Mack" slabs for use in every class of building, from such as Windsor Castle to a workman's cottage.

The joinery is well made, all the frames are solid, and has been executed by the Eagle Steam Joinery Works.

The interior of the cottage is finished with "Sirapite" plastering, and the woodwork has been stained and varnished internally and painted externally.

The architect is Mr. E. C. P. Monson, F.R.I.B.A., F.S.I., &c., of Finsbury Pavement House, London, E.C., who has made a special study of the housing of working classes, and who, as architect to the Sutton Trust, has in hand model dwelling schemes involving an outlay approximating to 500,000*l*., and accommodating about 10,000 people.

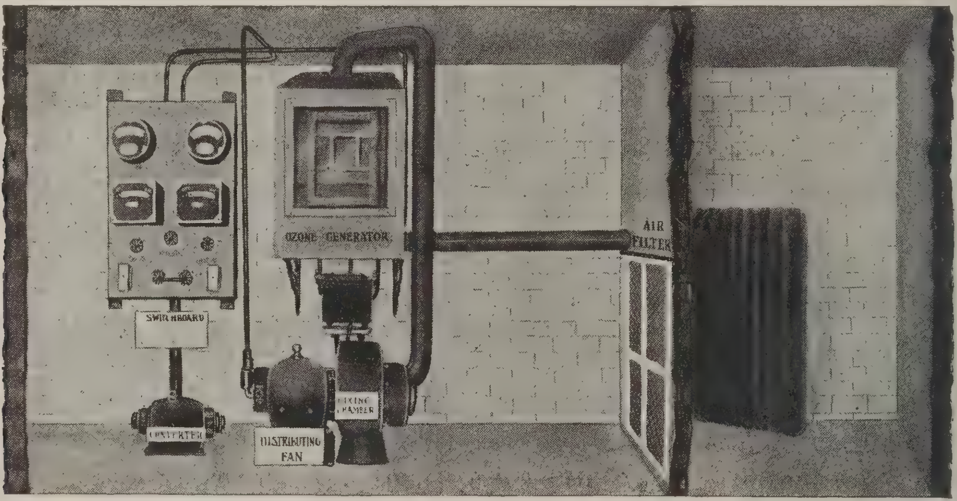
The following were the various contractors:—"Mack" walls, partitions and ceiling slabs, J. A. King & Co. ("Mack" fireproofing), 181 Queen Victoria Street, London, E.C.; "Cornes model cottager" range, boiler and bath combination, Cornes & Haighton, 240 High Holborn, London; joinery throughout, Eagle Steam Joinery Works, Plymouth; slating, battens and ridges, Froude & Dawson, Watford, Herts; plastering internally and externally, Murray & Son, 52 Wavendon Avenue, Chiswick, W.; glazing, British Luxfer Prism Syndicate, Ltd., 16 Hill Street, Finsbury; sanitary fittings, W. Farrer, Ltd., 39 Victoria Street, S.W.; oak paling, Major & Co., Hull; painting inside and out, Major & Co., Hull; the "Durabar" combined draught excluder and weather bar, The Durabar Co., 15 Palace Chambers, Hereford.

## OZONAIR VENTILATION.

Among the many handsome buildings which within the past few years have sprung up along Oxford Street a prominent place in the order of merit must be accorded to the new premises designed by Mr. John Murray, F.R.I.B.A., 11 Suffolk Street, S.W., for Messrs. D. H. Evans & Co., Ltd. They have come to be accepted as a happy solution of the many difficulties which beset an architect in carrying out this class of work. The exterior is doubtless already known at first or second hand to most of our readers. A pleasing façade does not, however, necessarily mean a successful building, for the interior is, after all, the part that matters most. Fortunately Mr. Murray has been equally happy in his plan and general arrangements as he was with his exterior design.

One of the most awkward of the many problems facing an architect entrusted with the erection of a great shopping rendezvous like the premises of Messrs. Evans must be the ventilation.

At the same time on it a great deal depends, for it is one of the few points on which the non-technical judgment of the customers has the best right to be heard. It is interesting to study the system adopted there for the reason that this particular difficulty seems to have received a conspicuously satisfactory solution. This opinion has been arrived at by the writer after a thorough perambulation of the building, commencing at the boiler-room in the sub-basement, and ascending finally to the kitchens on the fourth floor.



There is now a bewildering choice open to the architect in methods of ventilating on a large scale. But there can be little use in here detailing the various alternatives which offered themselves to Mr. John Murray; it is preferable to go direct to a brief account of that which has actually been installed. That is to say, we shall speak without further parley of the Ozonair system.

Some people who ought to be better informed seem to labour under the impression that the Ozonair system consists simply of the introduction of manufactured ozone into the vitiated air of a room. Such a proceeding, they argue, is in practice unworkable from the fact that if the ozone is to have any appreciable effect it must be introduced in such quantities as to become in itself a nuisance. Such a conception of the system of Ozonair, Ltd., 96 Victoria Street, Westminster, S.W., is wofully incomplete. It is true that ozone is introduced to replace that destroyed by the emanations which always arise when a number of persons congregate together and from other causes. But this is only one part of what happens. The plant is really that of a complete system of true plenum ventilation with the all-important addition of an ozone generator. What happens is briefly something like this: the outside air is drawn in by an electric fan through a water screen placed in the basement, and so filtered; next through a mixing chamber, where it is enriched by an infinitesimal proportion of pure ozone (the ozone being supplied from the generator); and finally the combined cleaned air and pure ozone is distributed throughout the building in such quantities as may be desired by tubes and ducts. In addition the chamber is fitted with a coil for heating or cooling the air prior to distribution. The main duct is of galvanised steel and is 10½ feet by 3½ feet section; through it can pass up to 50,000 cubic feet of air per minute if necessary, the exact quantity being under perfect control. From this main duct lead off a large number of other smaller ducts communicating with cunningly arranged flues which discharge the ozonised air through regulators at a height of about 7 or 8 feet from the ground.

The admixture of ozone is necessarily a very small proportion, since its odour is so pungent that one volume of ozone makes an appreciable difference to two and a half million volumes of air. Nevertheless it is the absence of this minute quantity of ozone that makes the principal difference between bracing sea air and the stuffy atmosphere of a basement. There was an excellent proof of the efficiency of the Ozonair system in the fact that the atmosphere in a sub-basement leading out of the boiler room about 25 feet below ground, and without any communication with the outside air was absolutely fresh. This was in striking contrast with the feeling experienced in a few parts of the building which at the time of our visit had not yet been linked up with the system. The ventilation is effected entirely without draughts, and it makes no difference whether the windows are opened or closed.

Ozonair, Ltd., are well known on the Continent and in America, in fact, they have branches all over the world. It is a remarkable fact that abroad and in America property owners as a matter of course set aside a good proportion of the cost of the building for the purposes of ventilation and heating, 10 per cent. being a common proportion.

The accompanying illustration and the following description will give a very good idea of the Ozonair system. The photograph is a sectional view of the plant. Commencing on the extreme right is the inlet chamber for the fresh air. The air can be either cooled or heated in this chamber. It is then drawn through the filter, which cleans it of all the smuts and at the same time absorbs all the deleterious gases, such as the ammonia and sulphurous acid gases which are always present in the air of large cities. The distributing fan, switchboard, and ozone plant are easily distinguished, and the whole plant is operated by the two regulating switches on the switchboard. The amount of air and also the proportion of ozone can be regulated at will.

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The Council of the Institute of Metals have accepted an invitation from the Glasgow members of the Institute to hold the annual autumn meeting in Glasgow. This meeting will take place on September 21 and 22, on which days papers of scientific and practical interest will be read, and visits made to works of metallurgical interest.

At the last meeting of the Hants County Education Committee the buildings sub-committee recommended that a high school for girls be erected at Basingstoke at a cost of 8,505*l.*; that 265*l.* be spent in laying on gas at the Winchester High School for Girls; that 1,950*l.* be spent on erecting a new Council school at Shipton Bellinger, and 450*l.* in erecting a teachers' dwelling-house there; that 5,580*l.* be spent on erecting a new infants' Council school at Sholing; 235*l.* on converting the Sholing boys' into a girls' school, and 550*l.* on converting Sholing girls' and infants' into a boys' school; and 78*l.* on erecting an iron fence at Pear Tree Green Council school. Notices are to be given to local authorities of the intention of the committee to erect new public elementary schools at Andover for 200 children, Bishopstoke for 300 boys, Bitterne for 250 children, Colden Common (to serve Fair Oak, Owslebury and Twyford) for 120 children, Crofton for 220 children, Headley for 150 children.

## TRADE MARKS OF CONSTRUCTIVE MANUFACTURERS.

We have received from Jacques Gevers & Co., L'Agence de Brevets et Marques de Fabrique, 70 Rue Saint-Jean, Antwerp, the following list of trade marks published in January and February 1910:—

### ENGLAND.

*Cement.*

| | |
|---|---|
| “Protex” | George M. Callender & Co., Ltd., 25 Victoria Street, S.W. |
| “Doros” | Restall's Adamantine Plaster Co., Birmingham. |
| “Bœuf” | The Oxford Portland Cement Co., Ltd., Kirlington, Oxford. |

*Constructive Materials.*

| | |
|---|---|
| “Wilmex” | G. & T. Earle, Ltd., Wilmington, Hull. |
| “Randofize” | Randolph Meech, Dorsetshire. |
| “Rhigothermo” | James Keith & Blackman Co., Ltd., 27 Farringdon Avenue, London. |
| “Ootpito” | Joseph Lockwood, 25 Gordon Street, Glasgow. |
| “Bituna” | Vulcanite, Ltd., 7 Donegal Square, Belfast. |
| “Pudlo” | Kerner-Greenwood & Co., St. Ann's Street, King's Lynn, Norfolk. |
| “Protex” | George M. Callender & Co., Ltd., London, S.W. |
| “Elaterite” | George M. Callender & Co., Ltd., London, S.W. |
| “Tarvialithic” | Bristowe & Co., Ltd., Westminster, S.W. |
| “J. Sheehan” | John Sheehan, 110 Mortimer Road, Kingsland, London, N. |
| “Restall's” | Restall's Adamantine Plaster Co., Birmingham. |
| “Stoncrete” | J. & R. Thompson, Ltd., 128 Roden Street, Belfast, Ireland. |
| “Bic” | The British Improved Construction Co., Ltd., 47 Victoria Street, S.W. |
| “Drednaut” | Thomas Broad, Ltd., Graham Works, Worcestershire. |

### GERMANY.

*Cement.*

| | |
|---|---|
| “Hannoversche Fabrik Misburg” | Hannoversche Portland-Cement-Fabrik-Actiengesellschaft, Hannover. |
| “Martinol” | Corundin, G.m.b.H., Alsdorf, Rheinl. |

*Constructive Materials.*

| | |
|---|---|
| “Fama” (rayons de soleil) | Hannoversche Steinholzfabrik “Fama,” G.m.b.H., Hannover. |
| “Radical-Heyl” | Ary G. Weber, Steglitz. |
| “Antihumid” | Ludwig Kopp, Leipzig. |
| “Bitulithic” | Deutsche Quarriten, Bitulithio-Pflaster, G.m.b.H., Berlin. |
| “Tornado” | Gebrüder-Pierburg, Berlin. |

### BELGIUM.

*Cement.*

| | |
|---|---|
| “Rammer Brand” | |
| “Waterloo Brand” | Société Ame des Carrières Dumon, Tournai. |
| “Hirondelle Volant” (dessin) | |
| “Royal Tiger Brand” | |
| “Crocodiles” (dessin) | |
| “Gladiator Brand” (aigle sur croissant, dessin) (aigle sur globe-éclair, dessin) | |
| “Croix” (dessin) | |
| “Chateau” (dessin) (lion couronné, dessin) | |
| “Drapeau Francais” (drapeau-soleil, dessin, et G.L.) | Louis Volkaerts, Antwerp. |
| “Ours” (dessin, B.M. & Co.) | Société Ame des Cimenteries et Briqueteries de Bruyelles, Bruyelles-lez-Antoing. |
| “Tortuca” | F. Berna, Antwerp. |
| “Cock Brand” (deux clefs croisées surmontées d'un coq, L.T.) | Bte Lemaire & Co., Antoing. |
| “Alpha” (usines, dessin) | Bte Lemaire & Co., Antoing. |
| “Trois Autruches” (dessin) | Lamm Bros. et Co., Anvers. |
| “Lion Debout” (dessin) | Cie Générale des Ciments Portland de l'Escaut, Tournai. |
| “Crocodile (Au)” (crocodile, dessin) | |
| “Fontaine Brand (Grand)” | Société Ame des Ciments de Grande Fontaine, Antoing. |
| “Grande Fontaine” | |
| “Pison” | |
| “Triunfante” (statue de Jeanne d'Arc) | Sylvain Van Sint Jan, Schaerbeek. |
| “Vitreosil” | Société Ame Belge de Constructions Incombustibles, Schaerbeek. |

*Colours, &c.*

| | |
|---|---|
| “Matalo” | Harold Wilson et Scholz, Cologne. |
| “Grenouille” (dessin) | Rob. Lambrechts & Co., Antwerp. |
| “Vernilin” | Jules Malherbe, Liége. |
| “Vitreosil” | The Thermal Syndicate, Ltd., Wallsend-on-Tyne. |

### FRANCE.

*Cement.*

| | |
|---|---|
| “Rose” | Pierre Henry, à Bouilladisse. |

*Constructive Materials.*

| | |
|---|---|
| “R. E. I. P. N.” | Louis Périn, 2 Rue Guichard, Paris. |
| “Compolite” | Venesta, Ltd., 20 Eastcheap, London. |
| “Elasto-Ciment” | Davidsen, 5 Rue Fénelon, Paris. |
| “La Pierreline” | M. J. Courrier, 25 Allée Franklin, Pavillons-sous-Bois. |
| “V. Plumier” | Victoire Plumier et André Mailloux, Saint-Zacharie. |
| “Marbritine” | M. Ernest Calvi, Nice. |
| “Soleil” | MM. Jules Estienne & Co., la Bouilladine. |
| “Nopica” | Société Générale Pinguet et Co., Rue des Capucines, Paris. |

### SWEDEN.

*Cement.*

| | |
|---|---|
| “Cæmentium” | Charles William Dopson, London. |

*Constructive Materials.*

| | |
|---|---|
| “Muralin” | Bremer Linoleumwerke Delmenhorst, Delmenhorst, Tyskland. |
| “Toori” | Japanska Mamasinet, Stockholm. |
| “Hanneton” | Gelius & Co., Göteborg. |

### SWITZERLAND.

*Constructive Materials.*

| | |
|---|---|
| “Elementetrotz” | Karl Streckzuss Fabrikation, Freiburg i. B., Germany. |
| “Congo” | Buchanan Foster Co., Philadelphia, U.S.A. |
| “Rubberlino” | Delmenhorster Linoleumfabrik, Delmenhorst, Germany. |

### LUXEMBOURG.

*Constructive Materials.*

| | |
|---|---|
| “M. W.” | Firma Mannesmannröhren-Werke, Düsseldorf. |
| “Congo” | Barrett Manufacturing Co., 17 Battery Place, New York. |
| “Protector” | Schirmherr Reformschirm-Fabrik Friedländer & Kaufmann, Frankfurt. |

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The Council of the Institute of Metals announce that there has been established at the offices of the Institute a Pathological Museum for specimens of metals and alloys, the first contributions to the museum having been received from the President, Sir Gerard A. Muntz, Bart. This museum, which is the only one of its kind, ought to be of great service to all interested in the metallurgy of the non-ferrous metals, as it is intended that it shall contain specimens showing the various ways in which such metals as copper, brass, aluminium, &c., can fail either as a result of faulty manufacture or of improper usage.

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Street in Nuremberg.
The Grand Canal and Church of St. Maria Della Salute, Venice.
The Ducal Palace and Pillars of St. Mark, Venice.
Piazzetta San Marco, Venice.
The Interior of St. Mark's, Venice.
The Rialto, Venice.
Bridge of Sighs, Venice.
Mausoleum of the Scaliger Family, Verona.
The Cathedral, Lausanne.
Street in Schaffhausen.
Basel, from the Rhine.
Geneva, View of the City.
Street Scene in Geneva.
Old Houses, Sion.
Como from the Lake.
The Cathedral, Milan.
The Cathedral, Milan (Interior).
At Domo D'Ossola.
The Roman Forum.
Temple of Pallas, Rome.
The Cathedral and Bridge over the Saône, Lyons.
The Church of St. Symphorien, Tours.
Ancient Church, now the Corn Hall, Tours.
Interior of the Castle Chapel, Amboise.
Interior of the Cathedral, Chartres.
Antwerp Cathedral.
Town Hall, Bruges.
Hôtel de Ville, Brussels.
Scene in Ghent, with Cathedral, &c.
Cathedral, Malines.
Kraenstrate, Malines.
Hôtel de Ville, Louvain.
Tournay, with Cathedral.
Palais du Prince, Liège.
Hôtel de Ville, Utrecht.
View of Cologne.
Hôtel de Ville, Cologne.
On the Walls, Cologne.
City of Cologne.
Near Godesberg.
Braubach-on-the-Rhine.
Andernach-on-the-Rhine.
Coblence.
The Cathedral, Mayence.
Château de Martinsbourg, Mayence.
Roman Pillar and View at Igel.
The Dome, Frankfort.
Sachsenhausen, Frankfort.
View of the Castle at Heidelberg.
Basel.
Cathedral, Ratisbonne.
View in Ratisbonne.
Ancient Building in Ratisbonne.
Old Palace, Bamberg.
View in Bamberg.
Wurtzburg, Ancient Bridge and Castle.
View in Wurtzburg.
View in Augsburg.
View in Nuremberg.
Strasbourg, with Cathedral.
View in Strasbourg.
St. Omer, Strasbourg.
Ulm, with View of Hall.
View in Munich.
View in Prague.
Ancient Buildings in Prague.
St. Nicholas Church, Prague.
Thein Church, Prague.
Hôtel de Ville, Prague.
Street in Dresden.
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View in Dresden.
Zwinger Palace, Dresden. [Staircase
Zwinger Palace, Entrance Hall and Grand
Hôtel de Ville, Brunswick.

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THE

# Architect and Contract Reporter.

FRIDAY, MAY 27, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 OLD QUEEN STREET, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

## COMPETITIONS OPEN.

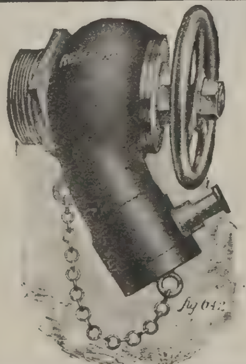
ASHTON-ON-MERSEY.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

BELFAST.—The Senate of the Queen's University of Belfast are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

EDINBURGH.—The Corporation invite competition designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

LONDON.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l.*, 50*l.*, and 25*l.* are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s.* 6*d.* Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.



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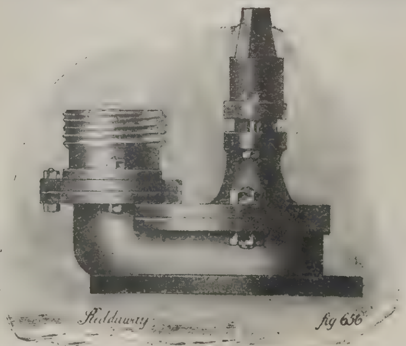

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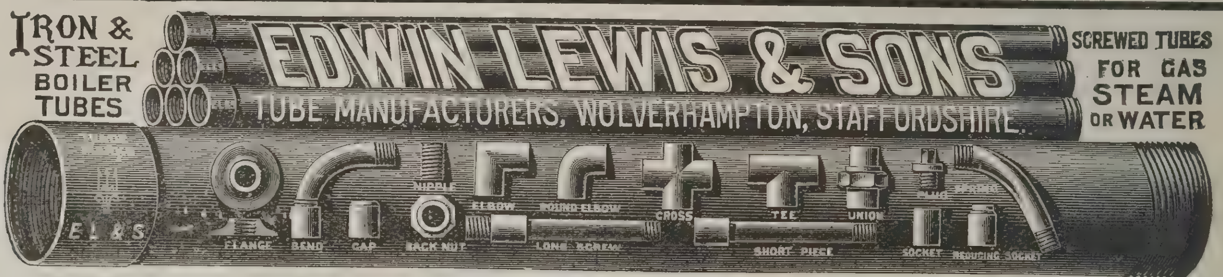

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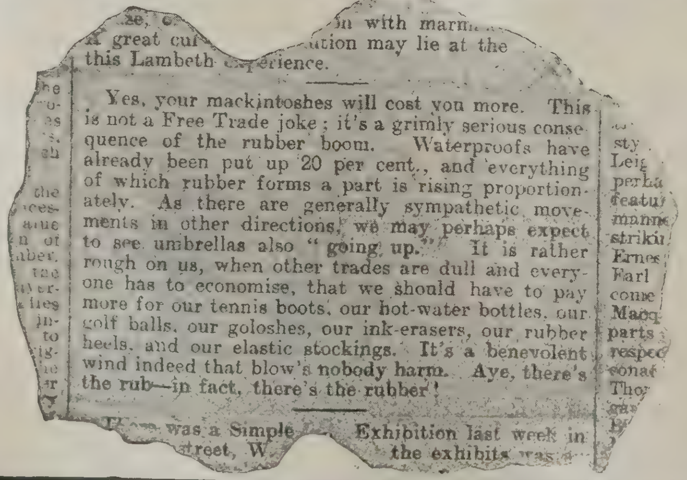

with marm
great cu ution may lie at the
this Lambeth experience.

Yes, your mackintoshes will cost you more. This is not a Free Trade joke; it's a grimly serious consequence of the rubber boom. Waterproofs have already been put up 20 per cent., and everything of which rubber forms a part is rising proportionately. As there are generally sympathetic movements in other directions, we may perhaps expect to see umbrellas also "going up." It is rather rough on us, when other trades are dull and everyone has to economise, that we should have to pay more for our tennis boots, our hot-water bottles, our golf balls, our goloshes, our ink-erasers, our rubber heels, and our elastic stockings. It's a benevolent wind indeed that blow's nobody harm. Aye, there's the rub—in fact, there's the rubber!

was a Simple Exhibition last week in
street, W the exhibits was

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## CONTRACTS OPEN.

Barnsley.—May 31.—For erection and completion of new wards, to accommodate thirty-eight beds, a new block for kitchens, and offices connected therewith, new sterilising and store-rooms, new electric lift, and reconstruction of corridors and renovations to central block, at the Beckett Hospital. Deposit 3*l*. 3*s*. Messrs. G. Moxon & Son, architects, Central Chambers, 26 Church Street, Barnsley.

Batley.—June 1.—For work to be done in erection of addition to clothing factory at Batley. Mr. B. Watson, architect and surveyor, Upper Taylor Street, Batley, Yorks.

Birkenhead.—June 13.—For plastering three wards at the Union Infirmary, Church Road, Tranmere. Mr. John Carter, clerk, Poor Law Offices, Birkenhead.

Bradford.—May 31.—For the following works, for the Corporation, viz.:—(1) St. James's Market, erection of store rooms; (2) St. James's Market, limewashing; (3) Rawson Place Market, painting, &c.; (4) Bolton Lane slaughter houses, limewashing. The City Architect, Town Hall, Bradford.

Bradford.—June 3.—For the erection of the superstructure (masonry, brickwork and 100 tons steelwork), of the sludge disposal works at Strongford. Deposit 3*l*. 3*s*. Mr. J. Garfield, A.M.Inst.C.E., Esholt Hall, Shipley.

Bridgnorth.—May 30.—For works of restoration and improvement at the North Gate. The Borough Surveyor's Office, Bridgnorth.

Burslem.—For erection of a new Primitive Methodist Sunday school, Hot Lane. Send 1*l*. 1*s*. deposit to Messrs. Ford & Slater, architects, Burslem.

Carlisle.—June 1.—For the extension of buildings at the Central Electric Lighting station in James Street. Deposit 10*s*. 6*d*. Mr. Henry C. Marks, M.I.C.E., city engineer and surveyor, 36 Fisher Street, Carlisle.

Chelmsford.—May 30.—For additions and alterations to school premises at the King Edward VI. Grammar School. Deposit 5*l*. Quantities will not be supplied. Messrs. Charles & W. H. Pertwee, architects, Chelmsford.

Church.—For proposed Queen's Hall and Picturedrome at Church, Lancs. Mr. A. E. Willward, St. James's Chambers, Accrington.

Cleckheaton.—June 2.—For erection of additions to Commercial Mills. Messrs. Howarth & Howarth, architects, Old Bank Chambers, Cleckheaton, Yorks.

Cockfield.—June 2.—For the enlargement of Cockfield Church, near Staindrop, Durham. The Rectory, Cockfield, or Mr. Wm. Morton, quantity surveyor, 45 John Street, Sunderland.

Croglin.—June 1.—For the whole of the works required in alterations and additions to Church of England schools, Croglin, Cumberland. The School House, Croglin, or Mr. J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle Street, Carlisle.

Crowthorne.—For the completion of two partially erected residences at Crowthorne, Berks. Mr. C. J. Brake, opposite Wellington College Station, Berks.

Deal.—June 4.—For alterations and additions to the Wesleyan day schools, Union Street. Mr. Ernest W. May, architect, Walmer, or at Lloyd's Agency, opposite Deal Pier.

Dunstable.—June 15.—For erection of a Council school at Dunstable. Send 1*l*. 1*s*. deposit by May 30 to Messrs. Gotch & Saunders, architects, Kettering.

Exeter.—For the erection of a garage and other work in Paris Street. Apply at once to Mr. J. A. Lucas, F.S.I., A.R.I.B.A., Guildhall Chambers, Exeter.

Forest Hall.—June 6.—For erection of proposed police station at Forest Hall, Northumberland. Deposit 2*l*. 2*s*. Mr. J. A. Bean, county architect, The Moot Hall, Newcastle-on-Tyne.

Goole.—June 1.—For erection of two cottages at the Pollington Waterworks. Mr. H. B. Thorp, architect, Carlisle Street, Goole.

Grimsby.—June 8.—For erection of a Council school in Strand Street. Deposit 2*l*. 2*s*. Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby.

Hadlow.—May 31.—For the laying of new drainage and construction of new offices at the Hadlow Council school, Kent. Mr. Wm. Stow, correspondent, Hadlow, Kent.

Halifax.—May 30.—For erection of two shops and appurtenances, at Skircoat, for the Halifax Industrial Society, Ltd. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Herne Bay.—May 28.—For alterations at the scattered homes, Mill Lane. Mr. Robert Messenger, A.R.I.B.A., Town Hall Buildings, Herne Bay, Kent.

Holmes Chapel.—June 11.—For alterations and additions to the Agricultural College, Holmes Chapel, Cheshire. Deposit 1*l*. Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Ireland.—May 31.—For the erection of a manse at the Woodvale Park Presbyterian church. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

Ireland.—June 1.—For erection of fifteen labourers' cottages, for the Rathdown No. 1 Rural District Council. Payment 5*s*. The Clerk to the Rural Council.

Ireland.—June 4.—For (*a*) general contractors' work; (*b*) shop fitting; (*c*) electric installation; (*d*) decoration of 67 Sackville Street, Dublin. Mr. George T. Moore, A.R.C.S.I., M.Inst.C.E.I., 1 and 2 Foster Place, Dublin.

Ireland.—June 7.—For enlarging labourer's cottage No. 81 in Tollymore, for the Kilkeel Rural District Council. Mr. John M'Aleenan, C.E., Castlewellan.

Keighley.—For the various works required in erection of a residence in South Street. Messrs. John Haggas & Sons, architects, North Street, Keighley.

Kendal.—June 6.—Tenders are invited, either in whole or separate trade contracts, for the erection of garage and power station at Hawesmead. Mr. John F. Curwen, F.R.I.B.A., F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Leicester.—June 9.—For an extension of the engine room, offices, &c., at the Tramways Power Station. Deposit 2*l*. Mr. E. G. Mawbey, M.Inst.C.E., borough engineer, Town Hall, Leicester.

Liversedge (Yorks).—May 30.—For improving the ventilation at Hightown Council school, joiners only. The Education Offices, Heckmondwike. Mr. Rawden Hill, divisional clerk.

London.—May 28.—For pulling down the premises Nos. 150, 162, 164 and 166 King Street, clearing the sites, and carting away the old materials, for the Hammersmith Borough Council. Mr. H. Mair, borough surveyor, Town Hall, Hammersmith, W.

London.—May 31.—For small additions and alterations and general repairs at Crosslands and Lindens, 218 and 220 London Road, Croydon. Deposit 5*l*. 5*s*. Mr. Henry Berney, architect, 104 George Street, Croydon.

London.—June 7.—For erection of two cottages at the rear of the central fire station, Queen's Road, Wimbledon, for the Corporation. Send 1*l*. 1*s*. deposit to the Borough Treasurer. The Borough Engineer's office, Town Hall, Wimbledon.

Ramsey.—May 31.—For a new police station at Ramsey. Deposit 2*l*. 2*s*. Mr. Herbert Leete, county surveyor, 36 High Street, Huntingdon.

St. Annes-on-Sea.—May 31.—For erection of a Primitive Methodist church and schools. Send names and addresses to Messrs. T. E. Davidson & Son, architects, 1 Eldon Square, Newcastle-on-Tyne.

St. Neots.—May 31.—For alterations and additions to the St. Neots police station. Mr. Herbert Leete, county surveyor, 36 High Street, Huntingdon.

Scotland.—June 2.—The Edinburgh Parish Council invite offers for structural alterations at hospital buildings, Craiglockhart Poorhouse. Mr. R. M. Cameron, architect to Council, 53 Great King Street, Edinburgh.

Scotland.—June 7.—Estimates are wanted for the mason, joiner, slater, and plasterer works of (1) addition to dwelling house at Rottal, Cortachy, and for joiner and corrugated iron roofing of covered court at Do; (2) new barn, cart shed, and granary, &c., at Coiliamy, Cortachy, joiner and slater works only. Mr. John Black, factor, Airlie Estate Office, Cortachy.

Somerset.—June 4.—For the taking down and rebuilding of Hartlake Bridge, on the main road between Glastonbury and Wells. Deposit 3*l*. 3*s*. The new bridge will be constructed of reinforced concrete, and is not designed on any particular patented system. The work comprises reinforced concrete piling, beams and slabs, piers and abutments, and three arches of the following spans, 22 feet, 11 feet, 11 feet; also masonry parapets and wing walls, roadworks, and temporary bridge. Mr. H. T. Chapman, county surveyor, Queen Square, Bath.

Stenalees.—June 1.—For the erection of a Wesleyan church at Stenalees, Cornwall. Messrs. F. C. Jury & Son, architects, 1 Alma Villas, Tregonissey Road, St. Austell.

Seaton.—May 30.—For erection of a residence at Seaton, Cumberland. Messrs. Donald & Donald, 14 John Street, Workington.

Shoscombe.—For erection of schools, offices, &c., at Shoscombe, near Bath, for the Foundation Managers. Mr. J. Beynon, architect, Frome.

Soudley.—For altering and extending the Council school at Soudley, Forest of Dean. Deposit 2*l*. 2*s*. Mr.

R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

Stanwix (Carlisle).—June 4.—For the various work in connection with the erection of the Miles Macinnes Memorial Hall. Mr. John Slack, architect, 18 Bank Street, Carlisle.

Tidworth.—June 8.—The Secretary of State for War invites tenders for the following work:—Erection of twelve blocks of troops stables, including drainage, water supply, pavings, &c., at Mooltan Barracks, Tidworth, Hants (or other selected site within the barrack area). Send 10*s.* deposit by May 30. The Director of Barrack Construction, 80 Pall Mall, London, S.W., or at the Barrack Construction Office, Tidworth.

Tidworth.—June 8.—The Secretary of State for War invites tenders for the following work:—The erection of twelve blocks of troops stables, including drainage, water supply, pavings, &c., at Assaye Barracks, Tidworth, Hants. Send 10*s.* deposit by May 30. The Director of Barrack Construction, 80 Pall Mall, London, S.W.

Uppingham.—June 7.—For new music-rooms at Uppingham school. The Bursar, the Bursar's Office, Uppingham School, Rutland.

Wales.—For making new roof of timber and slate over locomotive shed at Abersychan Collieries, 88 feet long by 29 feet 4 inches wide over walls. Powell's Tillery Steam Coal Co., Ltd., Abersychan Collieries, Talywain, Mon.

Wales.—May 28.—For erection of a covered play-shed at Brecon Road Infants' school, for the Merthyr Tydfil education committee. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—May 30.—For pulling down the present walls and railings facing the club premises, renewing same, together with tiling, &c. The Secretary, the Roath Conservative Club Co., Ltd., 7 Cyril Crescent, Cardiff.

Wales.—May 31.—For building ten houses at Abernant, Aberdare, for the Park View Building Club. Mr. Alec. S. Cameron, architect, 1 Glanant Street, Aberdare.

Wales.—May 31.—For alterations and additions to the Bridgend Cottage Hospital. Messrs. Geo. F. Lambert & Son, architects, Bridgend, Glam.

Wales.—May 31.—For the improvement and extension of Pentrebach school. Send names to the Deputy Surveyor, Town Hall, Merthyr Tydfil, and deposit 2*l.* 2*s.* with the Borough Accountant.

Wales.—June 2.—For erection of a farmhouse at the "Fedw," Cwm Taff, near Merthyr Tydfil. Deposit 10*s.* 6*d.* Mr. C. H. Priestley, M.I.C.E., waterworks engineer, City Hall, Cardiff, or Mr. R. C. Jenkins, Ashville, Cefn Coed.

Wales.—June 6. For erection of covered play sheds at Pantglas boys' school, Aberfan, Merthyr Tydfil. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—June 6.—For erection of an infectious diseases hospital near Pengam, consisting of two pavilions, lodge, laundry, stables, and administrative block, for the Gellygaer Urban District Council. Deposit 2*l.* 2*s.* Mr. P. V. Jones, architect, Bank Chambers, Hengoed.

Wales.—June 7.—For the erection of a new goods shed, stable, &c., at Duffryn Sidings, Caerau, Glamorganshire, for the Great Western Railway. The Engineer, Newport Station, Mon.

Wales.—June 8.—For erection of a Council school building at Lamphey, near Pembroke. Deposit 1*l.* 1*s.* Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

Warwick.—June 7.—For alteration of the premises acquired at the Aston Lower Grounds to fit the same for the requirements of the Territorial units. Deposit 3*l.* 3*s.* Messrs. James & Lister Lea & Sons, architects, 19 Cannon Street, Birmingham.

Waterloo.—June 20.—For the erection of the Crosby Road North Council School, Waterloo, near Liverpool. Deposit 1*l.* 1*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Yorks.—June 10.—The West Riding education committee invite whole or separate tenders for the following works, viz.: Bradfield, Stannington Council school; Swinton, Roman Terrace Council school, alterations and additions; Stainland-with-Old-Lindley, Bowling Green Council school, new woodwork centre (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit in each case to the West Riding Treasurer, County Hall, Wakefield.

---

Lord Rothschild has announced his intention of erecting about fifty labourers' cottages at Tring, Herts, to replace the small cottages condemned by the local district council.

# TENDERS.

## ASCOT.

For alterations and additions to Box Farm, Winkfield Row. Messrs. Geo. Ashby Lean & Son, architects, 491 Oxford Street, W.

| | | | |
|---|---|---|---|
| Charman | £610 | 0 | 0 |
| Payne & Co. | 607 | 0 | 0 |
| Watson | 579 | 0 | 0 |
| Acetylene gas installation | 112 | 3 | 0 |

## ATHERSTONE.

For laying about 4,000 lineal yards of stoneware pipe sewers and building the necessary manholes, &c.; also for the construction of sewage tanks, filters, pumping station, pumping main, and incidental works, for the township of Polesworth. Mr. H. J. Coleby, engineer, Atherstone.

| | | | |
|---|---|---|---|
| Whitehead & Sons | £6,733 | 1 | 9 |
| Currall, Lewis & Martin | 5,178 | 4 | 9 |
| Bell & Son | 5,081 | 15 | 7 |
| Brebner & Co. | 5,046 | 19 | 7 |
| Johnson Bros. | 5,032 | 16 | 5 |
| Dix & Co. | 4,957 | 12 | 0 |
| Finnegan | 4,799 | 12 | 0 |
| Trentham | 4,616 | 0 | 0 |
| Stimpson & Rollston | 4,587 | 5 | 9 |
| Jewell & Sons | 4,534 | 16 | 4 |
| Thorpe | 4,509 | 13 | 3 |
| Meredith | 4,466 | 1 | 5 |
| Buckley | 4,465 | 10 | 6 |
| Johnson & Langley, Leicester (*accepted*) | 4,464 | 7 | 7 |
| Engineer's estimate | 4,609 | 18 | 6 |

## BOOTLE.

For erection of a public elementary Council school, in the south-east district of Bootle, Lancs. Messrs. Medcalf & Medcalf, architects, Liverpool.

| | | | |
|---|---|---|---|
| Rimmer Bros. | £13,750 | 0 | 0 |
| Desser | 13,696 | 0 | 0 |
| Williams | 13,600 | 0 | 0 |
| Lloyd | 13,300 | 0 | 0 |
| Morrinson & Sons | 13,200 | 0 | 0 |
| Parker & Son | 13,120 | 0 | 0 |
| Kelly & Bros. | 13,084 | 0 | 0 |
| Duthie & Dobson | 13,020 | 0 | 0 |
| Hall & Son | 12,986 | 0 | 0 |
| Tyson | 12,910 | 0 | 0 |
| Webster | 12,750 | 0 | 0 |
| Tomkinson & Co. | 12,653 | 0 | 0 |
| Musker | 12,630 | 0 | 0 |
| Fowler | 12,603 | 0 | 0 |
| Gerrard & Sons | 12,600 | 0 | 0 |
| Costain & Sons | 12,598 | 0 | 0 |
| Wearing & Sons | 12,550 | 0 | 0 |
| Rothwell & Sons | 12,500 | 0 | 0 |
| Spencer | 12,500 | 0 | 0 |
| Haugh & Pilling | 12,339 | 0 | 0 |
| Hughes & Stirling, Bootle (*accepted*) | 12,250 | 0 | 0 |

## CAMPSALL.

For erection of walls, fencing, gates, and other work in connection with the burial ground at Campsall, near Doncaster.

| | | | |
|---|---|---|---|
| Mason | £357 | 11 | 6 |
| Bellamy | 350 | 0 | 0 |
| Broadhead & Co. | 347 | 6 | 6 |
| Spurr | 338 | 0 | 0 |
| Newton & Fisher | 335 | 4 | 0 |
| Attey, Campsall (*accepted*) | 320 | 0 | 0 |

## EAST KIRKBY.

For three houses, Welbeck Street. Mr. Walter H. Woods, architect and surveyor, Long Eaton, near Nottingham.

| | | | |
|---|---|---|---|
| Tate & Son | £629 | 10 | 0 |
| Bains | 618 | 0 | 0 |
| Coleman, East Kirkby (*accepted*) | 604 | 0 | 0 |

For four pairs of houses, Welbeck Street. Mr. Walter H. Woods, architect and surveyor, Long Eaton, near Nottingham.

| | | | |
|---|---|---|---|
| Coleman | £1,706 | 5 | 0 |
| Bains | 1,688 | 0 | 0 |
| Tate & Son | 1,679 | 10 | 0 |
| Hoole, Kirkby-in-Ashfield (*accepted*) | 1,650 | 0 | 0 |

## HAVANT (HANTS).

For drainage work at Farlington, for the Guardians.

| | | | |
|---|---|---|---|
| Spriggins | £3,279 | 0 | 0 |
| Croad | 3,165 | 0 | 0 |
| Mowlem | 3,150 | 0 | 0 |
| Atkinson | 2,941 | 9 | 9 |
| Wheeler & Co. | 2,931 | 3 | 9 |
| Farley & Co. | 2,872 | 7 | 9 |
| Bell | 2,797 | 0 | 0 |
| Douglas | 2,792 | 0 | 0 |
| Streeter & Co. | 2,765 | 19 | 10 |
| MUSSELLWHITE & SAPP, Basingstoke (*accepted*) | 2,675 | 0 | 0 |

## HIGH WYCOMBE.

For additions and alterations, &c., at Baptist Chapel, Holmer Green. Mr. ALFRED NASH, architect, High Wycombe.

| | | | |
|---|---|---|---|
| Clarke | £354 | 0 | 0 |
| Buckle | 335 | 0 | 0 |
| Wheeler & Sons | 320 | 0 | 0 |
| Moreton & Sons | 319 | 0 | 0 |
| Perfect | 310 | 0 | 0 |
| Harris | 309 | 0 | 0 |
| Harris & Co. | 285 | 0 | 0 |
| HAZELL, Hazlemere (*accepted*) | 275 | 0 | 0 |

## HORSHAM SOUTHWATER.

For tar-paving of the playgrounds, &c., at the Council school. Mr. HAYDN P. ROBERTS, A.R.I.B.A., County Education architect, Horsham.

| | | | |
|---|---|---|---|
| Tarmac, Ltd. | £180 | 0 | 0 |
| A. C. W. Hobman & Co. | 179 | 11 | 6 |
| North of England Asphalte Co. | 171 | 15 | 10 |
| Constable, Hart & Co., Ltd. | 159 | 0 | 0 |
| Wainwright & Co., Ltd. | 156 | 0 | 0 |
| Chittenden & Simmons, Ltd. | 154 | 2 | 3 |
| HOBMAN & Co., Peckham (*accepted*) | 151 | 0 | 0 |
| Architect's estimate | 155 | 0 | 0 |

## LONDON.

For construction of a new quay wall at the Council's Depot, Peckham Park Road, Old Kent Road, for the Camberwell Borough Council.

| | | | |
|---|---|---|---|
| Courtney & Fairbairn | £1,269 | 0 | 0 |
| Webb & Co. | 771 | 2 | 3 |
| Mowlem & Co. | 740 | 0 | 0 |
| Holloway Bros. | 725 | 0 | 0 |
| Munday & Sons | 714 | 0 | 0 |
| Garrett & Son | 699 | 0 | 0 |
| King & Son | 658 | 0 | 0 |
| Pedrette | 650 | 0 | 0 |
| Yorkshire Hennebique Contracting Co. | 650 | 0 | 0 |
| Kavanagh | 617 | 0 | 0 |
| R. & E. Evans | 597 | 0 | 0 |
| Ansell | 595 | 0 | 0 |
| Smith | 589 | 0 | 0 |
| Chafen & Newman | 549 | 10 | 0 |
| Parker & Sons | 547 | 0 | 0 |
| Woodham & Sons | 530 | 0 | 0 |
| Cochrane & Sons | 520 | 0 | 0 |
| Rowlingsons & Co. | 498 | 0 | 0 |
| F. & H. F. Higgs | 496 | 0 | 0 |
| British Fireproof Construction Co. | 466 | 0 | 0 |
| West & Son | 429 | 15 | 2 |
| Muirhead & Co. | 419 | 0 | 0 |
| ANDERSON, Poplar (*accepted*) | 390 | 0 | 0 |

## MARSDEN.

For the erection of four houses in Green Lane. Messrs. AINLEY & HIRST, architects and surveyors, Slaithwaite.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| A. & T. Haigh, Golcar, mason | £582 | 0 | 0 |
| Holroyd, Marsden, joiner | 240 | 0 | 0 |
| Firth, Marsden, plumber | 64 | 0 | 0 |
| J. & J. Bottomley, Marsden, plasterer and painter | 51 | 15 | 0 |
| Allison, Milnsbridge, tiler | 50 | 0 | 0 |
| J. & J. Bottomley, Marsden, concreter | 32 | 10 | 0 |

## SCOTLAND.

For the erection of a branch establishment at Lowvalleyfield, for the Dunfermline Co-operative Society, Ltd.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Clark, builder | £750 | 0 | 0 |
| Ramsay, joiner | 618 | 0 | 0 |
| Ure, plasterer | 150 | 0 | 0 |
| Thomson & Co., plumber | 73 | 0 | 0 |

## NEWCASTLE-ON-TYNE.

For erection of St. Mark's new parochial buildings. Mr. A. B. PLUMMER, diocesan architect, Newcastle and Tynemouth.

| | | | |
|---|---|---|---|
| Weir | £3,603 | 0 | 0 |
| Elliott Bros. | 3,591 | 10 | 10 |
| J. & W. Lowry | 3,481 | 14 | 11 |
| Easten | 3,480 | 0 | 0 |
| George & Son | 3,394 | 16 | 10 |
| MIDDLEMISS BROS., Newcastle-on-Tyne (*accepted*) | 3,393 | 16 | 0 |

## STIFFORD.

For carrying out distempering and painting works, at the children's homes, at Stifford, near Grays, Essex, for the Guardians of Stepney Union.

| | | | |
|---|---|---|---|
| Kingston | £595 | 17 | 6 |
| Heritier & Co. | 450 | 0 | 0 |
| Grays & Co. | 400 | 0 | 0 |
| Dainton | 398 | 0 | 0 |
| Aslett | 349 | 12 | 0 |
| Athey | 289 | 16 | 0 |
| NEWTON, Mile End, E. (*accepted*) | 240 | 0 | 0 |

## WALES.

For building a Masonic temple at Merthyr Tydfil, for the Loyal Cambrian Lodge of Freemasons (No. 110). Mr. C. M. DAVIES, architect, 112 High Street, Merthyr.

| | | | |
|---|---|---|---|
| Davids & Howell | £2,900 | 0 | 0 |
| Sullivan | 2,840 | 0 | 0 |
| JENKINS, Merthyr (*accepted*) | 2,800 | 0 | 0 |

For sewerage works, for Abertillery and Abercarn Urban District Councils. Mr. J. WILLIAMS, engineer, Council Offices, Abercarn, Mon.

| | | | |
|---|---|---|---|
| Peters | £913 | 0 | 0 |
| Johnston Bros. | 809 | 2 | 0 |
| Jones & Jones | 777 | 5 | 6 |
| Smith | 754 | 9 | 2 |
| LEWIS, Aberbeeg (*accepted*) | 649 | 2 | 6 |
| Jones | 638 | 10 | 0 |
| Davies, Ball & Co. | 501 | 14 | 3 |

For erection of a masonic lodge and caretaker's house, for the Worshipful Master and Brethren of the Forest Lodge of Freemasons. Mr. R. ORTON DOWDSWELL, architect, Cardiff.

| | | | |
|---|---|---|---|
| Jones Bros. | £1,075 | 0 | 0 |
| DAVIS, Bargoedstall, Bargoed (*accepted*) | 935 | 0 | 0 |
| Architect's estimate | 960 | 0 | 0 |

For erection of premises at Tylorstown, for the Ferndale Industrial Co-operative Society. Messrs. W. M. LEWIS & T. N. MORGAN, architects, Pontypridd.

| | | | |
|---|---|---|---|
| Williams | £5,599 | 0 | 0 |
| Jenkins & Sons | 5,468 | 0 | 0 |
| D. Richards | 5,320 | 9 | 6 |
| Isaac | 5,298 | 10 | 0 |
| Thomas & Co. | 5,230 | 0 | 0 |
| Rees & Co. | 5,181 | 12 | 8 |
| A. Richards | 5,061 | 2 | 6 |
| Davies & Howell | 5,056 | 4 | 5 |
| Davies & Sons | 5,018 | 0 | 0 |
| Turner & Sons | 4,898 | 0 | 0 |
| Evans & Bros. | 4,871 | 0 | 0 |
| Jones & Son | 4,850 | 11 | 8 |
| Humphreys | 4,800 | 0 | 0 |
| Colbourne | 4,776 | 3 | 9 |
| Evans | 4,595 | 4 | 6 |
| NIBLETT & DAVIES, Cardiff (*accepted*) | 4,540 | 14 | 2 |

## WINDSOR.

For alterations and repairs to the Cottage Homes at Englefield Green, for the Windsor Board of Guardians.

| | | | |
|---|---|---|---|
| Pizzey & Son | £395 | 0 | 0 |
| Hendry | 390 | 0 | 0 |
| Buckeridge | 377 | 0 | 0 |
| Potbury | 340 | 0 | 0 |
| Beauchamp | 339 | 0 | 0 |
| Roberts | 304 | 16 | 0 |
| KING & SON, Englefield Green (*accepted*) | 275 | 14 | 9 |

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THE streets and buildings committee of Edinburgh Town Council, who have under consideration the appointment of a successor to the burgh engineer, who has resigned on being appointed chief engineer to the Scottish Local Government Board, have agreed to recommend the Town Council to advertise the vacancy at a salary beginning at 600*l*., and rising to 800*l*.

## DISTRICT SURVEYOR'S CLAIM FOR FEES.

AN important question regarding the liability of a district surveyor to claim for fees under certain sections of the London Building Act was decided by the Divisional Court of the King's Bench Division, comprised of the Lord Chief Justice and Justices Channell and Coleridge, on Tuesday. The case came up on the appeal of Messrs. Galbraith Brothers, builders, from the decision of the stipendiary magistrate of Lambeth, the respondent being Mr. Bernard John Dicksee, the district surveyor for Newington. Mr. Dicksee in the court below sued the builders for 16*l.* 7*s.* 6*d.*, which he contended was due to him for work done as district surveyor during the building of the John Ruskin School for Mentally Defective Children, in Newington.

From the special case stated by the magistrate for the purposes of the appeal, it appeared that the appellants entered into a contract with the London County Council to build the school in question, and in May 1908 respondent wrote to them requesting a building notice under the London Building Act, 1894. As the decision by the High Court in the case of the "London County Council *v.* The District Surveyors' Association and Willis" was contemplated, it was subsequently arranged that the question of giving such building notice should be delayed until the decision was given. However, the respondent did certain work in connection with the building operations in his capacity of surveyor, and after the decision in the case referred to had been given, he again wrote to the builders for the building notice, at the same time sending in an account for his services rendered, which the builders refused to pay, contending that the buildings came amongst those specified within a section of the Act, and were exempt, and in consequence the respondent had no duties to perform, and could claim no fees. It was contended on Mr. Dicksee's behalf that under the Act of 1894 he was entitled to receive a building notice, and that the building was not such a one as was exempted under section 201, sub-section 5. Therefore he had duties to perform for which he could claim fees. The magistrate decided that the building was exempt within section 201, sub-section 5 of the Act, but notwithstanding that the fees claimed by the surveyor were rightly payable by the builders, and he gave judgment for Mr. Dicksee for the amount claimed. The question for the court was whether he was right in that decision.

After hearing Mr. Montague Lush, K.C., who was for the appellants,

The Lord Chief Justice said he thought the appeal was an attempt to render ineffective the judgment in the previous case which the court had decided, viz., "The London County Council *v.* The District Surveyors' Association and Willis." Mr. Lush had said that in that particular case there was nothing to be done by the surveyor, but that did not follow, for if the building did not require watching then the surveyor got his fees for doing little. Mr. Lush had also argued that if the surveyor could not show that he had done something from which the Council benefited he was not entitled to his fees, but of course that could not be upheld. They had come to the conclusion that the decision of the magistrate was correct, and the appeal would be dismissed with costs.

Justices Channell and Coleridge concurred, and the appeal was accordingly dismissed.

Leave to appeal was granted on Mr. Lush's application.

## VARIETIES.

THE Federal Council of Switzerland have been authorised to arrange for the erection of two grain warehouses at Altorf Station at a cost of 39,720*l.*

THE late Mr. Owen Jones, of 27 Grey Road, Walton, Liverpool, builder, left 32,278*l.* gross, of which 875*l.* is net personalty.

MR. T. HYSLOP URE, architect, has been instructed by the Dunfermline Parish School Board to prepare plans for a new school at Limekilns.

THE Leeds Improvements Committee recommend the City Council to arrange for an auction some time in the autumn for the sale of surplus lands belonging to the Corporation.

THE Belper Rural District Council on Saturday adopted a scheme prepared by Mr. R. Cordon, C.E., for a sewerage scheme and sewage disposal works for the parish of Crich. A loan is to be applied for amounting to 11,500*l.*

THE Glasgow Corporation last week adopted the Sewage Committee's minute containing the recommendation that the contractor be instructed to proceed with the construction of the North Renfrew west intercepting sewer. The estimated cost of the sewer on the adjusted prices is 29,925*l.* 9*s.* 6*d.*, or three times the amount originally expected.

THE Monmouthshire Local Education Authority have given notice of their intention to erect new schools at Ynysddu (550 scholars), Blackwood (550), Abercarn (300), Wattsville (550), and Pontymolle (650). The schools at Fleur-de-lis and Rumney are to be enlarged by 200 places and 120 places respectively.

THE York City Council adopted by a large majority the recommendation to erect in Exhibition Square a full-size statue of William Etty, R.A., the York artist. Mr. W. W. Hargrove, as sole surviving trustee of the Fine Art Exhibition, had offered to contribute 262*l.*, the total cost of the statue and work being 300*l.*

THE Senate of the University of Glasgow at a meeting have resolved to confer the honorary degree of Doctor of Laws (LL.D.) on Mr. John James Burnet, A.R.S.A., F.R.S.E., F.S.A.Scot., F.R.I.B.A., corresponding member of the French Architectural Society and of the American Institute of Architects.

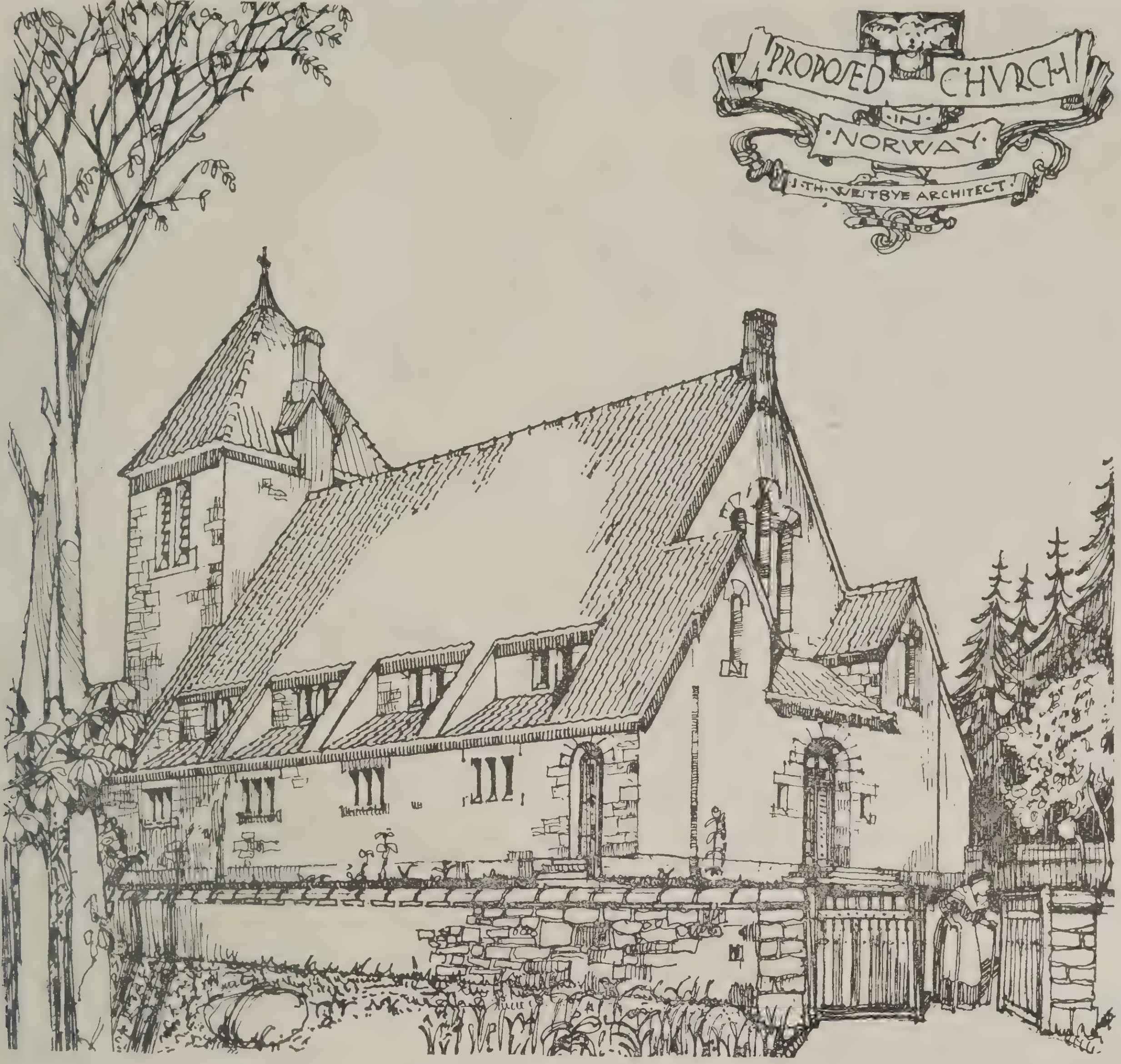
IN order to meet the want for working men's dwellings in Byfleet, a company is being formed, under the Industrial and Provident Society Act, to build about 80 cottages on the north side of Byfleet Station. The cottages will be let at the lowest rents possible to insure a maximum return of 4½ per cent. The plans for laying out the roads, and for the drainage, were submitted to the Chertsey Rural Council at their last meeting, and were passed by them. Mr. Raymond Unwin is the architect to the scheme.

A COMPANY is being promoted with a capital of 35,000*l.* for the purpose of providing a promenade pier and pavilion at Whitley Bay, Northumberland. The pier will have a total length, including the jetty at the extremity, of about 850 feet, with a minimum width of 40 feet, and a maximum width of 120 feet. The pavilion will be erected immediately to the right of the entrance, and abutting on the promenade. It will contain a concert hall or theatre capable of accommodating about 1,500 people.

THE Edinburgh School Board have approved plans submitted by Mr. J. A. Carfrae, architect, for the supplementary school in M'Leod Street, showing the necessary provision for practical instruction located in a building two storeys high, which it is proposed to erect along the north side of the ground. This building, which is intended to be of brick, will be 360 feet long. On the ground floor there will be four workshops and three cookery rooms, each containing 1,080 square feet, a staff-room, and two stores. On the upper floor there will be four workshops and two laundry rooms, each also containing 1,080 square feet, and practical science room, measuring 1,475 square feet, and one store. The building approved is distinct from the main elementary school to be erected on the M'Leod Street site. The main building will be placed on the south part of the site, and will accommodate 960 pupils in 24 class-rooms.

THE Edinburgh Dean of Guild have granted the Grand Lodge of Freemasons of Scotland warrant to take down the present buildings at 96 and 98 George Street, Edinburgh, and erect new buildings in their place. The new hall will accommodate 780 persons. On the first floor will be the offices, including a board-room and Grand Master's room. The second floor has two halls and accommodation for the use of daughter lodges. The elevation to George Street is to be of polished stone, and the design follows the style of architecture which characterised the buildings erected in Edinburgh at the end of the eighteenth century. The interior of the hall will be panelled on the lower portion, and suitable provision is made for an organ behind the platform. The total cost will be about 30,000*l.* The plans have been prepared by Mr. A. Hunter Crawford, F.R.I.B.A.

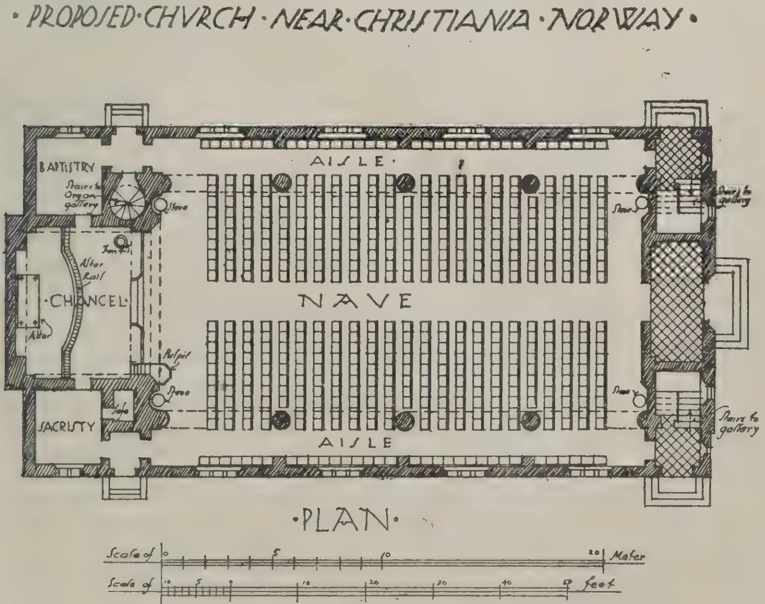
THE Belfast Corporation last week authorised the issue of Corporation Stock to the amount of 300,000*l.* The total amount to be devoted to various city improvements, and it is all to be issued for immediate expenditure, which has already received the sanction of the Local Government Board. 83,000*l.* is to be devoted to the extension of the asylum at Purdysburn; 50,000*l.* for capital expenditure in connection with the gas works; 40,000*l.* for improvements in the electricity department; 25,000*l.* for tramway extensions; 20,000*l.* for permanent paving of streets; 20,000*l.* for the erection of a public abattoir; 12,800*l.* for footpath improvements and street widening; 7,000*l.* for the purpose of widening Castle Street, one of the main thoroughfares of the city; 3,000*l.* for the completion of the quay wall at the refuse destructor works at Laganbank; 3,000*l.* for the erection of a bridge over the Lagan at Stranmillis; 2,700*l.* on account of the Sydenham and Knock drainage scheme; 2,750*l.* for the erection of a disinfecting station at Laganbank Road; and 750*l.* for the erection of a bridge over the Great Northern Railway at Donegall Road.



## PROPOSED CHURCH NEAR CHRISTIANIA, NORWAY.

The site for this church is magnificently placed, being on the top of a hill overlooking seven counties. It is proposed to use granite as the main material as it is obtainable on the spot. The pantiles for the roof and tower will be of local manufacture. The scheme of the plan is a typical example of a country Lutheran church, and shows seating accommodation for 800. This includes the choir, who would be seated in a gallery over the south aisle.

The design has been kept simple and severe in character in order to harmonise with the surroundings. The architect is Mr. J. Th. Westbye.



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## THE ILLUMINATING ENGINEERING SOCIETY.

The holding of the annual general meeting on Monday, May 23, terminated the first session of the Illuminating Engineering Society. This Society, it will be recalled, was formed last year in order to bring together engineers, architects, members of the medical profession, and others interested in illumination, in order that an impartial and international platform might be provided for the discussion of problems of this kind. The work of the last session has fully demonstrated the usefulness of this Society. There has been a steady growth in the number of articles in the technical press, and in papers read before societies, dealing with various aspects of lighting. Municipal authorities are coming to take a more active interest in street lighting, and gas and electrical supply companies now pay much attention to the conditions of illumination enjoyed by the consumer. In addition, the most recent reports of the Factory Department of the Home Office and of the medical officer to the London County Council show that the importance of good lighting in schools and factories is now more fully appreciated. Good illumination, it is now felt, is not a luxury, but a necessity.

The first year's work of the Illuminating Engineering Society has proved two things; firstly, that the discussions, in which representatives of different systems of lighting took part, were of a perfectly amicable character; and secondly, that there would not be the least difficulty in the future of finding plenty of matter for discussion.

During the session the membership has steadily increased, and is also of a very representative character, including gas and electrical engineers, representatives of systems of lighting using oil, petrol air, and acetylene, professors in technical colleges, medical men, architects and surveyors, manufacturers of lamps, shades, and reflectors, &c. What is equally satisfactory is that the Society has been able to secure the co-operation of so many leading authorities in this country, on the Continent, and in the United States. During the past session the first three distinguished honorary members of the Society have also been elected. They are Sir William Preece, one of the earliest to study the measurement of illumination; Sir Joseph Swan, one of the inventors of the electric incandescent lamp, and Professor A. G. Vernon-Harcourt, the inventor of the ten candle-power Pentane standard of light.

A special feature of the past session has also been the co-operation of eminent corresponding members of the Society, many of whom have participated in the discussions of the Society. The Society hopes that in the future their international attitude will be influential in the promotion of common agreement and standardisation of photometrical terms and processes, &c. In this work they will have the benefit of the co-operation of the American Illuminating Engineering Society, who have already passed a resolution expressing their desire for mutual assistance on the part of the two bodies.

The Society has also received an official invitation to be represented at the International Medical Congress to be held in Brussels this year, and proposes to send delegates. At this Congress the question of the hygienic conditions of factories and schools, and the effect of light on the health of employees, will be studied in connection with the engineering aspects of illumination.

During the past session five monthly meetings of the Society have been held. The inaugural meeting took place on November 18, 1909, and was followed by four discussions in 1910 on "Glare, its Causes and Effects," and "The Measurement of Light and Illumination" respectively. At the inaugural meeting the President, Professor S. P. Thompson, D.Sc., F.R.S., delivered his inaugural address, in which he summarised the intentions of the future work of the Society, and Sir Boverton Redwood, Mr. A. P. Trotter, Professor J. S. Haldane, Mr. W. M. Mordey, and Dr. R. M. Walmsley expressed their sympathy with the movement.

The subsequent meetings dealt with subjects of wide public interest and attracted a considerable amount of attention outside the Society. Now that so many different systems of lighting, many of them of great brilliancy, are available, it is a matter of considerable consequence to understand exactly what is meant by a "glaring" system of illumination, and to know how to avoid such an effect by the judicious placing of lights and the use of shades, &c. This subject received special attention from oculists and members of the medical profession, many of them taking part in the discussion, and afterwards becoming members of the Society.

The next two meetings, devoted to "The Measurement of Light and Illumination," also proved most successful. A feature of the proceedings was the exhibition by the inventors of different types of instruments, and the demonstration of their actual use in practice. The contributions to these discussions by foreign members of the Society, including Dr. L. Bloch (Berlin), Dr. L. Bell (Boston), Professor A. Blondel (Paris), Dr. M. Corsepius (Cologne), Dr. H. Krüss (Hamburg), Professor Rumi (Genoa), Dr. K. Stockhausen (Dresden), Professor R. Ulbricht (Dresden), Professor L. Weber (Kiel), and many others, were of exceptional interest.

The first anniversary dinner of the Society, which took place on February 10, also proved most successful.

The occasion served to show how fully the work of the Illuminating Engineering Society receives the support of other older bodies, and how wide is the nature of the subject with which it proposes to deal.

In the next session it is again proposed to devote the monthly meetings of the Society to subjects of general interest, and arrangements are being made for papers on such subjects as the lighting of streets, shops, libraries, schools, &c., and the recent developments of gas and electric lighting, &c. During the past year the Society has gained support in many influential quarters, and it is hoped during the next session to extend still further its circle of sympathisers and its scheme of operations.

## FUNDAMENTAL CONSIDERATIONS IN ENGLISH TOWN PLANNING.*

In this paper I shall endeavour to answer two questions, viz., "Why are town extension plans necessary in Great Britain?" "What are the fundamental conditions to be followed in order to secure the best town extension plans?"

Before endeavouring to provide answers to these questions may I venture to point out that at the present time in England you have in your desire to arrive at wise decisions on this point the great advantage of dealing with an absolutely open question, for your methods of town extension planning have yet to be developed? It is a matter of vital importance that you should educate a strong public opinion (for without a strong public opinion nothing of real value can be secured) on this subject, and the British people should understand that the good health of the nation will in future depend on the wise preparation of these plans. In Germany "the town makes the people," who are shaped and moulded by the laws which they are bound to obey. In countries in which individual liberty is the basis of social life the contrary, however, holds good, "the people make the town." This is especially the case in Great Britain at the present time.

In these days when we desire to get to work quickly there is not a little danger of forgetting these elementary principles. As a proof of this let me draw your attention to the strong desire shown day by day to apply "en bloc" in one country the methods followed in another country, without giving time to reflect on the insanity of such a course.

It is necessary to protest with energy against this "five minutes' system" of eagerly copying on entering into one's own house that which one has seen in the house of one's neighbour. This "five minutes' system" has produced so many errors in town planning in the various European countries that it is important that I should definitely draw your attention to the real danger of such a course.

In studying the life of the people in the centuries immediately preceding the Christian era—centuries in which a high degree of civilisation was reached—we are struck with the keen sense of natural laws possessed by these people and the adaptation of their daily life to these natural laws. In their dwellings and in their buildings of all kinds they consciously strove to find the best forms to suit the conditions of climate and consequently the needs of daily life of the individual citizens. The planning of their small boroughs and their ideal little cities is almost perfect.

It will not be too much to say that amongst these ancient people there was almost a complete equilibrium between beauty and utility—between the expression of material life and of moral life. This condition of equilibrium was nearly attained by the Greeks and in a large measure by the Romans. In all countries of the world it may be said that a similar condition of equilibrium is possible of attainment wherever men are gathered together in cities.

In those countries in which the mildness of the climate renders it possible that life can be spent in a large degree in the open air, the method of planning towns will be quite different to that in places where the climate is either much colder or more humid, and where, as a result life cannot be spent out of doors to the same extent. Numerous and eloquent examples could be given of this.

Coming now to the consideration of the fundamental conditions of town extension planning in detail let me urge that the climatic conditions of each country should first of all determine the conditions under which the people are housed.

This would at first sight seem to be a truism, but it is a truism which is far from being generally recognised. Whether the climate is wet or dry, subject to extremes of temperature in summer or in winter, whether the sunless days of the year are more or less numerous, whether certain prevailing winds render necessary special modification in the method of building—all these should be determining causes in regard to methods of constructing dwellings. The importance of these special climatic conditions affecting the country as a whole should never be lost sight of when the work of designing dwellings for the people is under consideration. If we compare the climatic conditions of the beautiful country of Tuscany for a moment with the climatic conditions of Lancashire we shall find the two extremes of conditions governing town extension planning. In one country parks and promenades on the borders of the city can with advantage be provided in a much greater extent than in the other country. The people of Tuscany can at all times leave their dwellings to visit these places. In Lancashire, on the other hand, open spaces and gardens ought to be in the close vicinity of the dwellings in order to enable the people to secure fresh air without travelling far from their homes.

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* A paper entitled "Consideration of the Fundamental Conditions which should govern Town Extension Planning in Great Britain." Prepared for the National Town Planning Council by Monsieur Augustin Rey, Architecte, Paris, Membre du Conseil supérieur des Habitations à Bon Marche, Corresponding Member of the International Committee on Tuberculosis.

The variety of climatic conditions imposes, therefore, a similar variety of methods in preparing town extension plans.

It is equally important that we should have clearly in mind the fundamental interests which must be served in making future plans for city developments. These fundamental interests are concentrated almost entirely on one point, viz., the need for incurring such expenditure as shall be of direct service either to the health or the happiness of the people, and the reduction of the expenditure which is only profitable to a small section of the community. No man increases his vital power by placing a mass of lead on his shoulders instead of covering his body with warm clothing. It is exactly the same with the inhabitants of a town.

In examining the town expenditure which is to-day incurred in the organisation of town life, one finds that this expenditure can be placed in four categories:—

(1) Cost of land occupied by public roads, free spaces and parks, and public buildings; (2) cost of constructing streets, water supply and other similar works of public service, and especially the maintenance of public parks; (3) cost of general municipal administration; (4) cost of health and hygiene administration in the different parts of the city.

In the municipal budgets of rapidly extending cities the chapters relating to the prices paid for land needed for (1) the making of public ways and the widening of streets found too narrow for the increasing traffic, (2) the purchase of land in order to clear congested areas, (3) the purchase of land for the purpose of buildings, and (4) the purchase of land for general public works, are together responsible for the expenditure of great sums of public money. As a result only small sums of money are available for that part of health improvement which consists in providing open spaces in the vicinity of congested dwellings, providing pure air and light for these dwellings or for the provision of parks, &c.

In this lack of capital is to be found the principal cause of bad hygiene in our cities. The uninterrupted increase in the price of urban land which is found operating everywhere in great cities thus adversely affects the municipal budgets of these cities. The lack of sufficient municipal means affects all matters concerning the development, and especially the hygiene of the city. On the one side the capital of the community is swallowed up by the unproductive purchase of land, and on the other hand the capital used to improve conditions of life in the town becomes every day more insufficient.

The present anti-social conditions have as a definite result the continual increase of "dead capital," as we call it in France, and the interest to pay the necessary charges on this dead capital becomes a more crushing burden as years pass by.

The method which it is necessary for municipal activity to take in the future is the reverse of this present system. The city ought to use every effort to diminish in very great proportions the amounts expended in the raising of values of town lands, for these sums are "dead capital" as far as the great mass of citizens are concerned. On the other hand the city should increase expenditure on all those things which will be productive of health and hygiene for the people.

Instead of using capital to legitimate and consolidate the growing price of land in the city, the municipal authority should use all its resolution, all its intelligence and all the capital it can raise for the purpose of improving the conditions of the working-class quarters and increasing by every possible means the value of the capital of life—a capital which in a progressive community should be always increasing and improving.

It is this increase in the value of human life which is essentially the capital of the people—and not the increasing value of the land on which they live—and one of the means of attaining this end is undoubtedly to be found in the rational organisation of town extension.

In this task Great Britain has a singular superiority as compared with other European nations. In this country at the present day you have a system of land ownership under which the possession of great areas of land—including the land on which several of your great towns stand—is still in the hands of a few owners. In regard to extension plans this is a unique position and one which, if in other respects there are certain disadvantages, is in this matter of town planning a most valuable auxiliary feature.

It should be recognised that in order to produce their full fruits the preparation of town extension plans should be directly related to the purchase of great areas of land at uninflated prices by municipalities in the interest of the general public. The law should clearly authorise and definitely encourage local authorities to deal with the problem in this way.

Most certainly they should not be compelled, as at present, to seek the permission of the central authority before making these purchases. It is necessary that your Parliament should realise that it is not in the national interest that local authorities should in these matters of hygiene and municipal development—questions of primary importance to each district—not be held in tutelage like infants whose every step must be watched.

The wealth of a great nation is built up of the wealth of all those centres which we call towns. It is possible that in this matter of municipal freedom some towns are under the control of committees filled with responsible men of good sense—men who know what are the best and most business-like steps to take.

At the International Congress on Hygiene held in Berlin in September 1908, this subject was considered and the Congress passed the following resolution as embodying the general opinion of hygienists:—"In order that limits may be placed to land speculation it is desirable that municipalities, representing as they do the special interest of public hygiene, should possess large areas of land bought at cheap prices, and on this municipal land should encourage in whatever way they deem best—allowing for local conditions—the building of dwellings which shall be economical in cost and shall satisfy the laws of hygiene." A most interesting example of this has been given by the city of Ulm in Würtemberg. Let me give you a brief account of the methods which have been adopted by this city to deal with speculation in land.

Under the energetic guidance of an enlightened municipality this town has prepared a definite programme and without hesitation has used the municipal credit of the city to buy large areas of land. Ulm has realised that this question of the land is at the root of the housing question, and that it is only by keeping down the price of land over a long period of years that the healthy house can be created and maintained.

The municipal council of Ulm bought under advantageous conditions the land comprised in the old fortifications of the city and followed up this purchase by other most important operations. To-day Ulm actually possesses 80 per cent. of the total area of the town. Without approving entirely this municipalisation of land one is bound to realise the great advantages which result from this policy in the construction of suitable dwellings and the healthier life of the people.

They lease their land for 100 years, and in addition lend the greater part of their capital for the construction of the houses, and at the end of the leasehold period the town will be able to purchase the houses at their actual value.

The financial position of the city is a most prosperous one as a result of this land policy, and the rates of the city have been reduced. This remarkable example of logical municipal development and tenacity of administration in the interests of the community must be attributed to the remarkably able Oberburgermeister, Herr Otto Wagner.

On examining in the cold light of science the causes of increase of land values in great centres of life what do we find? What gives to these urban lands their great value—a value which in some cases is a colossal increase as compared with former values? Is the increase not due entirely to the work, the activity, and the industry of the people as a whole? The present iniquitous method which seeks to impose itself on all the people who fill our cities and which seeks to leave them bound hand and foot by land speculation, must give place to methods which shall be more equitable and which shall take into account the superior interest of the whole of the inhabitants in their desire to live under conditions of normal health.

We are beginning to realise the misdeeds (one ought almost to say the criminal misdeeds) that land speculation has wrought in great cities in opposing the health of the people—the true wealth of a country. The land in which men are gathered together in cities will one day be regarded as a commodity in which it will be criminal for men to speculate.

There is a direct relation—and on this point statistics are quite clear—between the price of the land in those districts in which the majority of the inhabitants of a town live and their sanitary condition. Dear land shuts out the sun—the purificator "par excellence"—from the interior of dwellings. It denies to those who dwell in these houses their human share of pure air.

Cheap land, on the other hand, renders unnecessary the construction of those abominable dwellings of several floors, one of the plagues of modern humanity, and against this type of dwelling all reflective citizens should protest in whatever country they are found.

Our wiser descendants will without doubt pass strong laws forbidding the erection of block dwellings.

Cheap land means the family home bathed in fresh air and surrounded with sufficient space to enable the direct rays of the sun to exercise their regenerating influence. Dear land has incontestably been responsible for the bad state of our cities. Land kept at reasonable prices will, on the other hand, minister to the joy of the people. The question of the purchase of large areas of land at low prices is therefore one of fundamental importance in the establishment of rational plans of town extension.

The success of town extension depends before all on the solution of this question of cheap land. In possessing large areas of such land the town can be the master in determining the price of the land and in securing that the execution of works of general well-being and public works shall be carried out.

(*To be concluded.*)

## TRADE NOTES.

The "England" Works of North Street, Leeds, have removed their London offices from 73A Queen Victoria Street, to 295 Ivydale Road, S.E.

Messrs. Griffiths & Co., Ltd., of London Wall, E.C., have secured the contract at 4,250,000*l*. for the construction of a new railway in the Republic of Chili.

Messrs. W. & J. R. Hunter, Ltd., timber merchants, of 5-11 Bethnal Green Road, London, E., request us to announce that their telephone numbers are 6143 Central (for inward calls), and 2702 London Wall.

A large clock has just been erected in the parish church tower, Pytchley, Northants, which shows time on a dial 6 feet 6 inches across, and strikes the hours on a large tenor bell. The work has been carried out by John Smith & Sons, Midland Clock Works, Derby, who made the clocks in the neighbouring churches of Rothwell, Orlingbury, and Irthlingborough.

Messrs. J. B. Joyce & Co., Whitchurch, Salop, have received instructions from the West Riding County Council to make a large clock for the new training college now in course of erection near Bradford. It will strike the hours on a bell weighing 6 cwt., and show time upon four dials 6 feet in diameter, for illumination at night. The clock will contain all the best and most modern improvements. The same firm are making a large clock for the Refuge Assurance offices, Manchester, with four dials, 12½ feet diameter, and another for St. Peter's Church, Macclesfield. They have just fixed a large striking clock at Thornton-le-Moors Church, near Chester, and are now fixing a striking clock at St. Joseph's College, Dumfries.

Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester, have recently supplied their patent Manchester Stoves, with descending smoke flues, to the Women's Hospital, Soho Square, London; the extensions to the Guildford Union and the new Infirm Block, Warrington Workhouse Infirmary, are being warmed and ventilated by means of Manchester Stoves and Grates; the new schools, Scartho, near Grimsby, and Dr. William's School, Dolgelly, are being warmed and ventilated by means of the Manchester Grates; and the Princes Hall, Hull, is being ventilated by means of this firm's patent Exhaust Roof Ventilators. Messrs. E. H. Shorland & Brother, Ltd., have also supplied their Warm Air Ventilating patent Manchester Grates for the offices of Messrs. Foster Brothers, Gloucester, and the Council Offices, Cottingham.

## TRADE CATALOGUES.

Messrs. Grey & Marten, Ltd., City Lead Works, Southwark Bridge, S.E., have recently issued a cloth-bound priced catalogue which extends to nearly four hundred pages, of which the index alone occupies nine. The first section deals with ranges, register stoves, mantelpieces, and accessories. The next section is devoted to sanitary goods like baths, lavatory basins, closets, and plumbers' brass work; then follows such builders' ironmongery as rim locks, and door furniture of all kinds, electrical fittings, rain-water fittings, gas fittings, pumps, and a miscellaneous assortment of other goods. The catalogue is well printed on high-class paper.

The Pyramid (K. B. & S.) Brand of Portland Cement has been known in this country for close upon half a century; to be exact, it was in 1853 that Messrs. Knight, Bevan & Sturge first produced this well-known brand. Some millions of tons have been sent out of their works since then, and the quality has been steadily improving ever since. Ten years ago the firm transferred their business to the Associated Portland Cement Manufacturers (1900), Ltd., and under the new control the whole of the plant has been reconstructed and put abreast of the latest scientific ideas. An excellent illustrated pamphlet has been prepared to suggest how the material is prepared and how successful it has proved both in actual use and in laboratory tests. It is a noteworthy fact that the list of the more important works where the "Pyramid" Brand has been used is almost entirely made up of foreign contracts.

S. W. Francis & Co., Ltd., have, of course, their fine premises in Gray's Inn Road (Nos. 64-70), London, W.C., and from them come the latest improvements in wood, steel, and iron revolving shutters, as well as shop front fittings of all descriptions. Their 1910 illustrative and descriptive price list will give much valuable information and many useful suggestions in specifying fronts for banks, shops, public buildings, &c. Particular attention is called to their new Patent No. 4 Steel Hinged Self-acting Wood Shutter as a "speciality," for style and quality, combined with the simplicity of its working. This shutter is manufactured from the best pine, in uniform convex laths, connected with patent steel hinges. They are attached to stout barrel cases and charged with steel spiral springs of the best possible manufacture, and possess the striking feature that they are the only springs that run throughout the entire breadth of shutter and bearing, thereby ensuring against the deflection from unevenly distributed weight. Messrs. Francis & Co. have shutters specially designed to meet the variety of purposes for which they are now installed. It would appear from the price list that the firm have won the confidence of architects and engineers, for they have put up work at a great number of electric stations, garages, markets, railway termini, banks, and theatres. We can well believe that there is scarcely a town in the Kingdom which does not contain some of their work.

"Electricity Applied to Light and Power" is the title of a well illustrated booklet issued by Messrs. Drake & Gorham, Ltd. It is described as a treatise on the application of electric current to every phase of country house and estate requirements. The second part of the book is occupied with a long list of their electric light installations and subsequent testimonials. Practically every page contains photographs of buildings and plant which give it additional interest.

Messrs. Bristowe & Co., Ltd., Broad Sanctuary Chambers, 20 Tothill Street, Westminster, S.W., and at Blackpool, have sent us an excellent little catalogue of their H. H. Sanitary Fittings. The most striking characteristic of these is their modernity. It would seem as if the firm do not turn out an article for the simple reason that it is a successful line with other firms, but that they only enter the field when they have devised some cardinal improvement on existing types. Thus the catalogue illustrates and describes baths, lavatories, closets, sink gullies, and grease traps; in each article there is some distinctive feature which reveals the expert mind. The improvements are not a mere alteration of a minor detail made for the sole purpose of rendering the article technically different, they are genuine advances. It may be often observed that sanitary fittings have been designed with an almost exclusive regard to their appearance, and at a considerable sacrifice of efficiency. The H.H. fittings, while by no means lacking the attraction common to a fitting of high make and finish, have been primarily designed to remedy those defects in principle and detail which are to be found in existing types. Their combined footbath and children's bath, for instance, only occupies 2 feet 9 inches by 2 feet 6 inches of floor space and affords an effective bath with only 6 to 8 gallons of water. The water comes from a mixing tank overhead, raised about 9 feet from the floor. It can be supplied from existing hot water arrangements, or from an independent water heater. The improvements of the H.H. closet are particularly in respect to the patent junction with metal soil pipe, the removal of the necessity for a solder joint in the wall, the increased water area, and improved flush pipe joint. The H.H. iron grease trap is designed to meet a growing necessity for the prevention of grease entering the waste pipe stack when the scullery sinks are on the upper floors of a building. The catalogue illustrates and describes these and other plumbing specialties which have been put on the market after lengthy tests by Messrs. Bristowe & Co., Ltd.

THE

# Architect and Contract Reporter.

FRIDAY, JUNE 3, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

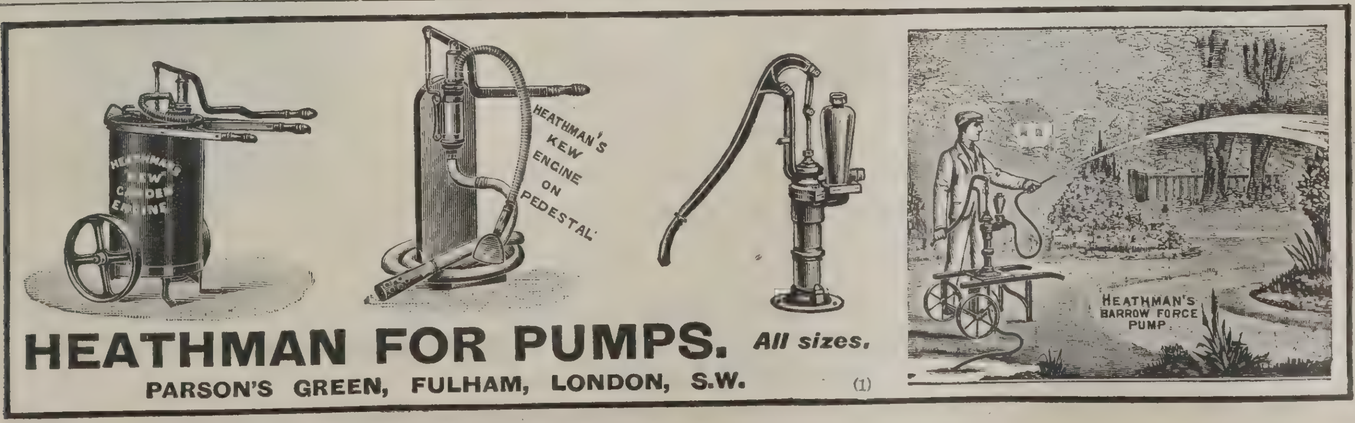
Ashton-on-Mersey.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

Belfast.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l*. Assessor, Sir Aston Webb, R.A. Two premiums of 150*l*. and 100*l*.; particulars 2*l*. 2*s*., returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Edinburgh.—July 9.—The Corporation invite designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton. W.



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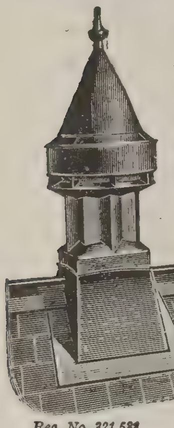

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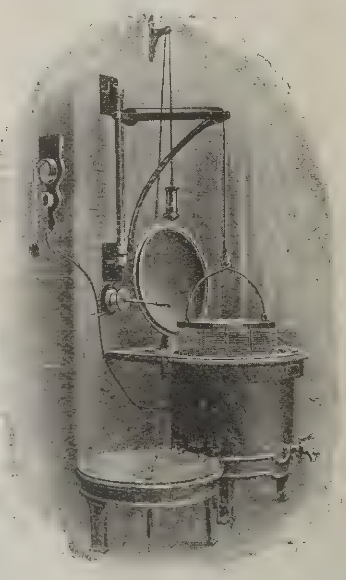

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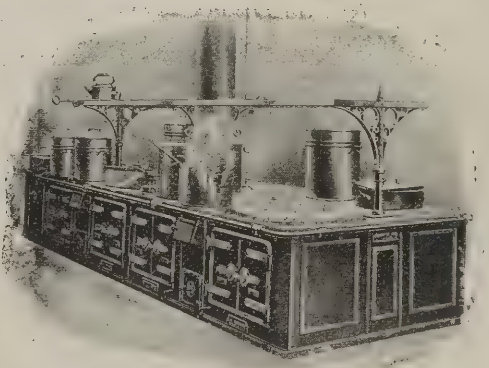

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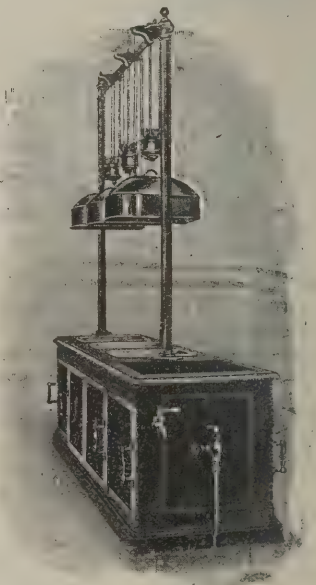

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## CONTRACTS OPEN.

Bewcastle, near Carlisle.—June 17.—For the mason work required in erection of a girder bridge at Bailey Mill, Bewcastle. Mr. James Murray, surveyor, Kirklinton, Carlisle.

Birkenhead.—June 13.—For plastering three wards at the Union Infirmary, Church Road, Tranmere. Mr. John Carter, clerk, Poor Law Offices, Birkenhead.

Birkenhead.—June 14.—For building repairs at the Guardians' stable and yard, Oliver Street, Birkenhead. Mr. John Carter, clerk, Poor Law Offices, Birkenhead.

Bridgwater.—June 7.—For alterations, cleaning and renovation of parts of the interior of the municipal offices and town hall. The Borough Surveyor, Municipal Buildings, High Street, Bridgwater.

Bristol.—June 10.—For the extensions of the infirmary, comprising the erection of new wards for about 180 beds, operating theatres, and casualty department, on a site in Marlborough Street. Deposit 10*l.* Messrs. Bernard & Son, quantity surveyors, 26 Orchard Street, Bristol.

Bentham.—June 10.—For the builder, joiner, plumber and painter works required at the Head Teacher's House, Bentham Lower Council School. Education Architect, County Hall, Wakefield.

Carlisle.—June 6.—For the whole of the works required in erection of additions to wash-house at Fusehill Workhouse. Mr. George Armstrong, architect, 24 Bank Street, Carlisle.

Chadderton.—June 18.—For erection of wash-houses, &c., in connection with the caretakers' house at Eustace Street and Stanley Road schools. Mr. J. Whitehead, clerk to the committee, Education Offices, Chadderton, Lancs.

Charney Bassett.—June 7.—For erection of a small holding dwelling-house and farm buildings at Charney Bassett, Berkshire. Mr. W. E. C. White, County Land Steward's Office, Assize Court, Reading.

Chester.—June 13.—For building a fire-station at the premises in Northgate Street. Deposit 1*l.* Mr. James Strong, architect, 11 Dale Street, Liverpool.

Chislehurst.—June 15.—For erection of a post-office. Deposit 1*l.* 1*s.* The Postmaster, Chislehurst. H.M. Office of Works, Storey's Gate, London, S.W.

Dewsbury.—June 6.—For the various works required in alterations and additions to the Gladstone Liberal Club. Messrs. Kirk, Sons & Ridgway, F.R.I.B.A., architects, surveyors and valuers, Market Place, Dewsbury.

Durham.—June 14.—Sole tenders are required by the Durham Education Committee (1) for alterations and additions at Black Boy Council school; Mr. F. H. Livesey, architect, Newgate Street, Bishop Auckland; (2) for alterations and additions at Eldon Council school and caretaker's house at Murton Colliery; Mr. F. E. Coates, Shire Hall, Durham; (3) for manual instruction room at Cockton Hill; Mr. W. Rushworth, Shire Hall, Durham.

East Preston.—June 6.—For erection of a verandah to the infirmary, and the conversion of existing premises as a meat store, at the workhouse, East Preston, Sussex, for the Guardians of East Preston Union. The Chairman of the Board, East Preston, near Worthing.

Farnham.—June 21.—For certain repairs to be executed to Tilford East Bridge. Deposit 10*s.* 6*d.* Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Farnham.—June 21.—For erection of proposed cottages at their Ash and Hindhead depôts, for the Farnham Rural District Council. Deposit 10*s.* 6*d.* for each cottage. Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Forest Hall.—June 6.—For erection of proposed police station at Forest Hall, Northumberland. Deposit 2*l.* 2*s.* Mr. J. A. Bean, county architect, The Moot Hall, Newcastle-on-Tyne.

Grimsby.—June 8.—For erection of a Council school in Strand Street. Deposit 2*l.* 2*s.* Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby.

Guildford.—June 18.—For certain decorative work and repairs to the elementary schools. Mr. C. G. Mason, A.M.I.C.E., borough surveyor, Tuns Gate, Guildford.

Halifax.—June 6.—For the various works comprised in the erection of three houses at Brow Foot Gate. Messrs. Longbottom & Culpan, architects, George Street, Halifax.

Halifax.—June 23.—For the various works required in erection of eight dwelling-houses, &c., in Lemington Avenue. Messrs. Medley Hall & Son, architects, 1 Harrison Road, Halifax.

Hensingham.—June 7.—For erection of two houses at Hensingham, Cumberland. Mr. J. S. Stout, architect, 36 Lowther Street, Whitehaven.

High Spen (Durham).—June 4.—For erection of nineteen cottages at High Spen, for the Consett Iron Co., Ltd. Mr. Chas. E. Oliver, the company's architect, at the General Offices, Consett.

Holmes Chapel.—June 11.—For alterations and additions to the Agricultural College, Holmes Chapel, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Holme.—June 10.—For the whole or separate works required in erection and completion of a school at Holme, Westmorland. Mr. Malcolm G. Shaw, architect, 45 Highgate, Kendal.

Ireland.—June 7.—For enlarging labourer's cottage No. 81 in Tollymore, for the Kilkeel Rural District Council. Mr. John M'Aleenan, C.E., Castlewellan.

Ireland.—June 8.—For plastering and painting inside of and other repairs to Glencar Church. Mr. John Ross, Hill House, Glencar, or Rev. A. R. Burriss, Lurganboy Rectory, Manorhamilton.

Ireland.—June 18.—For erection of a combined hall and school at Aghadowey Presbyterian Church. Mr. S. J. M'Fadden, C.E., architect, Queen Street, Coleraine.

Kendal.—June 6.—Tenders are invited, either in whole or separate trade contracts, for the erection of garage and power station at Hawesmead. Mr. John F. Curwen, F.R.I.B.A., F.S.A., architect and sanitary engineer, 26 Highgate, Kendal.

Kirton.—For erection of a brick and slate warehouse (size 260 feet long, 38 feet wide), in two floors, and proposed to be built adjoining Kirton station yard. Mr. Henry Kidd, Solent House, Kirton, near Boston, Lincs.

Leicester.—June 9.—For an extension of the engine room, offices, &c., at the Tramways Power Station. Deposit 2*l.* Mr. E. G. Mawbey, M.Inst.C.E., borough engineer, Town Hall, Leicester.

Leeds.—June 20.—For the erection of workshops for the Gas Department in Sovereign Street. Deposit 3*l.* 3*s.* Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

London.—June 7.—For erection of two cottages at the rear of the central fire station, Queen's Road, Wimbledon, for the Corporation. Send 1*l.* 1*s.* deposit to the Borough Treasurer. The Borough Engineer's office, Town Hall, Wimbledon.

London.—June 20.—For the following works, for the West Ham Education Committee, viz.:—Cleansing, repairs and painting of thirteen schools, new covered playground at one school, and installing electric light at three schools, to be executed during the summer vacation. Send 1*l.* 1*s.* deposit by June 11 to Mr. William Jacques, A.R.I.B.A., architect to the Education Committee, 2 Fen Court, Fenchurch Street, E.C.

London.—June 8.—For the construction of an above-ground convenience for both sexes in Brooke's Market, for the Holborn Borough Council. The Borough Surveyor, Council Offices, Holborn, W.C.

Milnthorpe.—June 6.—For extensions to the vagrant wards at Milnthorpe workhouse. Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

Newhey.—June 13.—For erection of an elementary school for 350 scholars at Newhey, near Rochdale. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Newcastle-upon-Tyne.—For alterations at Chillingham Road and Westmorland Road schools, and also for drainage works at Mitford Street, Heaton Park Road, Victoria Jubilee and Chillingham Road schools. The Secretary, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

New Malden.—June 30.—For erection of Church schools at Kingston Road. Messrs. Vincent Davison & Nicol, architects, Coombe Chambers, New Malden.

Oldham.—June 7.—For alterations to gas and water offices, Greaves Street. Deposit 1*l.* 1*s.* The Gas and Water Offices, Greaves Street, Oldham.

Richmond (Yorks.).—June 21.—For erection of public lavatories in the Ronaldshay Recreation Ground. Mr. H. W. Marsden, borough surveyor, Tower Street, Richmond, Yorks.

Rochdale.—June 8.—For erection of a chimney 50 yards high at the gasworks in Dane Street. Mr. T. Banbury Ball, manager, at the Gasworks.

Rotherham.—June 8.—For erection of a boundary wall at the Isolation Hospital, Badsley Moor Lane. Mr. E. B. Martin, A.M.I.C.E., borough engineer, Town Hall, Rotherham.

Scotland.—June 7.—Estimates are wanted for the mason, joiner, slater, and plasterer works of (1) addition to dwelling house at Rottal, Cortachy, and for joiner and corrugated iron roofing of covered court at Do ; (2) new barn, cart shed, and granary, &c., at Coiliamy, Cortachy, joiner and slater works only. Mr. John Black, factor, Airlie Estate Office, Cortachy.

Scotland.—June 10.—For extension of Kirkcaldy Post Office. Deposit 1*l.* 1*s.* The Postmaster, Kirkcaldy; or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—June 11.—For mason, carpenter and slater work of addition and repairs to dwelling-house and steading on the farm at Hatterseat, Menie, Belhelvie. Mr. John P. Cumine, advocate, 8 Golden Square, Aberdeen.

Scotland.—June 15.—For erection of a new orchestra at the United Methodist Church, Troon. Mr. Joseph Rodda, Treslothan Road, Troon.

Scotland.—June 15.—For additions and alterations to the Post Office, Johnstone, Renfrewshire, in one contract. Deposit 1*l.* 1*s.* The Postmaster, Johnstone, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Stantonbury.—June 4.—For erection of a coachbuilder's workshop and showroom on a plot of land in Newport Road, Stantonbury, Bucks. Mr. J. Dellar, architect, 16 Moon Street, Wolverton.

Tendring.—June 20.—For erection of a reception home for children at the workhouse at Tendring, Essex. Mr. G. H. Page, architect, Trinity Chambers, Colchester.

Torksey.—June 12.—For the erection of an engineer's cottage at the pumping station, for the Notts Court of Sewers. Mr. W. Southall, architect, Chapelgate, Retford.

Uppingham.—June 7.—For new music-rooms at Uppingham school. The Bursar, the Bursar's Office, Uppingham School, Rutland.

Wales.—June 6.—For erection of small boiler house and two closets at Merthyr Vale Schools, and for the remodelling of the closets at Abercanaid School. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—June 6.—For erection of an infectious diseases hospital near Pengam, consisting of two pavilions, lodge, laundry, stables, and administrative block, for the Gellygaer Urban District Council. Deposit 2*l.* 2*s.* Mr. P. V. Jones, architect, Bank Chambers, Hengoed.

Wales.—June 7.—For the erection of a new goods shed, stable, &c., at Duffryn Sidings, Caerau, Glamorganshire, for the Great Western Railway. The Engineer, Newport Station, Mon.

Wales.—June 7.—For the erection of eighteen houses, with boundary and retaining walls, and formation and making of roads at Snatchwood, Abersychan. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

Wales.—June 8.—For erection of a Council school building at Lamphey, near Pembroke. Deposit 1*l.* 1*s.* Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

Wales.—June 8.—For the following works, for the Glamorgan County Council, viz. :—(1) Improvements at Wern Council school, near Ystalyfera; (2) boundary wall and foundations for temporary building at Cwmrhydyceirw, near Morriston; (3) alterations to the old school at Tongwynlais; (4) additions to the Hendre Council school, near Caerphilly; (5) additions to the Cwmaber Council school, Abertridwr. The County Council Offices, Westgate Street, Cardiff.

Wales.—June 8.—For erection of sixty-four cottages under the Housing of the Working Classes Act at Ebbw Vale, for the Urban District Council. Mr. T. J. Thomas, town surveyor, Ebbw Vale, Mon.

Wales.—June 9.—For alterations and repairs to the Beaufort Arms Hotel, Beaufort, Mon.; also for rebuilding cottages, five in number, at Beaufort Hill. Mr. H. Waters, M.S.A., architect and surveyor, Market Chambers, Ebbw Vale.

Wales.—June 11.—For erection of a draper's shop at Evans Street, Kenfig Hill. Mr. Aneurin T. James, architect and surveyor, Bisley House, Pyle, near Bridgend.

Wales.—June 27.—For work to be done and materials used in making alterations and additions for the conversion of Cyfarthfa Castle into a secondary school, and the erection of science laboratories, art and lecture rooms, with latrines, playgrounds and other works in connection therewith, for the Corporation of Merthyr Tydfil. Deposit 5*l.* 5*s.* Mr. T. F. Harvey, M.I.C.E., borough engineer, Merthyr Tydfil.

Walsall.—June 7.—For erection of a sub-station building, for the Corporation. Deposit 1*l.* 1*s.* The Borough Electrical Engineer, Electricity Works, Wolverhampton Street, Walsall.

Warrington.—June 8.—For pointing the external walls of the buildings comprising the Warrington Union Workhouse. Mr. Arthur Bottomley, clerk, Bewsey Chambers, Warrington.

Warwick.—June 7.—For alteration of the premises acquired at the Aston Lower Grounds to fit the same for the requirements of the Territorial units. Deposit 3*l.* 3*s.* Messrs. James & Lister Lea & Sons, architects, 19 Cannon Street, Birmingham.

Waterloo.—June 20.—For the erection of the Crosby Road North Council School, Waterloo, near Liverpool. Deposit 1*l.* 1*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Whitby.—For erection of two arches each about 22-feet span, in reinforced concrete, at East Row Bridge, Whitby Rural District, for the North Riding of Yorkshire County Council. Mr. W. G. Bryning, county surveyor, Northallerton.

Windsor.—June 13.—For alterations and additions to the boys' and girls' schools in the Bachelor's Acre, for the managers of the Windsor Royal Free Schools. Messrs. Edgington & Spink, architects, 52 High Street, Windsor.

Yorks.—June 10.—The West Riding education committee invite whole or separate tenders for the following works, viz. : Bradfield, Stannington Council school; Swinton, Roman Terrace Council school, alterations and additions; Stainland-with-Old-Lindley, Bowling Green Council school, new woodwork centre (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit in each case to the West Riding Treasurer, County Hall, Wakefield.

## TENDERS.

### BRIGHTON.

For the construction of an overground lavatory and tram shelter at the north end of Victoria Gardens. The Borough Surveyor, Brighton.

| | | | |
|---|---|---|---|
| J. & W. Simmonds | £410 | 0 | 0 |
| Hockley & Co. | 396 | 0 | 0 |
| Field & Cox | 390 | 0 | 0 |
| Penfold | 387 | 0 | 0 |
| McMillan | 359 | 0 | 0 |
| **Bostel Bros.** (*accepted*) | 355 | 0 | 0 |

### BRISTOL.

For the erection of a factory at Staple Hill. Messrs. Fredk. Gardiner & Son, architects, Bath.

| | | | |
|---|---|---|---|
| Long & Sons | £2,182 | 0 | 0 |
| Blake | 2,150 | 0 | 0 |
| Simmons | 2,072 | 0 | 0 |
| Love | 2,037 | 0 | 0 |
| Amery | 1,995 | 0 | 0 |
| Marsh & Stone | 1,990 | 0 | 0 |
| Foster | 1,944 | 0 | 0 |
| Colborne | 1,936 | 0 | 0 |
| Watts | 1,923 | 0 | 0 |
| Wilkins & Sons | 1,878 | 0 | 0 |
| Adams & Jefferies | 1,875 | 0 | 0 |
| **Walters & Sons**, Montpelier (*accepted*) | 1,867 | 0 | 0 |

### DURHAM.

For the construction of new sewers at Quarrington Hill.

| | | | |
|---|---|---|---|
| Carrick | £458 | 10 | 0 |
| Pickering | 424 | 4 | 11 |
| **Oliver**, Gilesgate Moor (*accepted*) | 407 | 0 | 0 |
| Reavell | 388 | 3 | 3 |
| Henderson | 369 | 16 | 8 |

For the construction of new sewers at Shincliffe Colliery.

| | | | |
|---|---|---|---|
| Henderson | £282 | 0 | 0 |
| Pickering | 257 | 15 | 10 |
| Carrick | 237 | 0 | 0 |
| **Oliver** (*accepted*) | 217 | 19 | 6 |

### EPSOM.

For erection of a nurses' home at the workhouse, and alterations to Middle House.

| | | | |
|---|---|---|---|
| **Pasterfield & English**, Streatham (*accepted*) | £2,027 | 0 | 0 |
| *Alterations to kitchen.* | | | |
| **Wilkins & Son**; Bristol (*accepted*) | 649 | 0 | 0 |
| *Cooking apparatus.* | | | |
| **Barford & Perkins**, Peterborough (*accepted*) | 262 | 0 | 0 |

### FRESHWATER, I.W.

For the re-erection of Mr. H. Dowty's premises. Mr. J. W. NEWMAN, surveyor, Station Road, Freshwater.

| | | | |
|---|---|---|---|
| Ball & Son | £3,390 | 0 | 0 |
| Medway | 2,903 | 10 | 0 |
| Meader | 2,748 | 0 | 0 |
| White | 2,296 | 10 | 0 |
| Twyman | 2,250 | 0 | 0 |
| WILLIAMS, Newport, I.W. (*accepted*) | 2,000 | 10 | 0 |
| Stock | 1,794 | 0 | 0 |

### GUILDFORD.

For alterations and additions to workhouse, and for the erection of a house for the master and matron.

*Additions to workhouse.*

| | | | |
|---|---|---|---|
| Brand | £649 | 0 | 0 |
| Mitchell Bros. | 625 | 0 | 0 |
| Tanner | 620 | 0 | 0 |
| Wallis | 614 | 10 | 0 |
| Rowland Bros. | 584 | 0 | 0 |
| Bunning & Adams | 569 | 0 | 0 |
| Higlett & Hammond | 560 | 0 | 0 |
| SWAYNE & Co., Guildford (*accepted*) | 558 | 0 | 0 |
| Cook & Sons | 555 | 0 | 0 |
| Martin, Wells & Co. | 549 | 0 | 0 |
| Smith | 549 | 0 | 0 |
| F. & H. F. Higgs | 547 | 0 | 0 |
| Drowley & Co. | 546 | 0 | 0 |
| Goddard & Sons | 530 | 0 | 0 |
| Love | 526 | 0 | 0 |
| Tribe & Robinson | 525 | 0 | 0 |
| Ellis | 518 | 0 | 0 |

*Master and matron's house.*

| | | | |
|---|---|---|---|
| Mitchell Bros. | £810 | 0 | 0 |
| Brand | 799 | 0 | 0 |
| Wallis | 768 | 0 | 0 |
| Cook & Sons | 745 | 0 | 0 |
| Bunning & Adams | 741 | 0 | 0 |
| Martin, Wells & Co. | 740 | 0 | 0 |
| Higlett & Hammond | 735 | 0 | 0 |
| Smith & Son | 730 | 0 | 0 |
| Goddard & Sons | 729 | 0 | 0 |
| F. & H. F. Higgs | 729 | 0 | 0 |
| Tanner | 728 | 0 | 0 |
| Rowland Bros. | 714 | 0 | 0 |
| Ellis | 710 | 0 | 0 |
| Tribe & Robinson | 698 | 0 | 0 |
| Love | 668 | 0 | 0 |
| Drowley & Co. | 650 | 0 | 0 |
| SWAYNE & Co., Guildford (*accepted*) | 597 | 0 | 0 |

### LEEDS.

For construction of a bridge at Kirkstall.

| | | | |
|---|---|---|---|
| Arnold & Son (*recommended*) | £13,967 | 0 | 0 |

### LIVERPOOL.

For alterations and additions to the Workhouse, Smithdown Road. Mr. W. W. THOMAS, architect and surveyor, Liverpool.

| | | | |
|---|---|---|---|
| Green | £8,690 | 0 | 0 |
| Jones & Sons | 8,580 | 0 | 0 |
| Brown & Backhouse | 8,000 | 0 | 0 |
| Morrison & Sons | 7,950 | 0 | 0 |
| Thornton & Sons | 7,909 | 0 | 0 |
| Tomkinson & Sons | 7,777 | 0 | 0 |
| Henshaw & Sons | 7,649 | 0 | 0 |
| Dilworth | 7,600 | 0 | 0 |
| Lloyd | 7,535 | 0 | 0 |
| Rimmer Bros. | 7,411 | 0 | 0 |
| TYSON, Liverpool (*accepted*) | 7,383 | 0 | 0 |

### LONDON.

For cleaning and painting works and repairs at the North-Eastern Hospital, London, for the Metropolitan Asylums Board.

| | | | |
|---|---|---|---|
| Lole & Co. | £2,570 | 0 | 0 |
| Jewell | 2,500 | 0 | 0 |
| Woodward | 2,029 | 1 | 9 |
| Fenn | 1,989 | 0 | 0 |
| Woollaston & Co. | 1,814 | 0 | 0 |
| Oram & Son | 1,770 | 9 | 2 |
| Proctor & Sons | 1,722 | 0 | 0 |
| Nightingale | 1,669 | 0 | 0 |
| Inns | 1,627 | 0 | 0 |
| Milton | 1,613 | 0 | 0 |
| McCarthy, Clapham Park (*recommended*) | 1,549 | 0 | 0 |

### LONG DITTON.

For making up King's Road.

| | | | |
|---|---|---|---|
| Mowlem & Co. | £1,299 | 0 | 0 |
| Lane | 1,271 | 0 | 0 |
| Wilcox | 1,267 | 0 | 0 |
| Free & Sons | 1,207 | 0 | 0 |
| Bailey & Weller | 1,195 | 0 | 0 |
| Blaker | 1,192 | 0 | 0 |
| May | 1,101 | 0 | 0 |
| Wheeler & Co. | 1,047 | 0 | 0 |
| KAVANAGH & Co., Surbiton (*accepted*) | 1,027 | 0 | 0 |

### PALMER'S GREEN.

For elementary school at Hazelwood Lane, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | | | |
|---|---|---|---|
| Stewart | £6,696 | 0 | 0 |
| Lawrance & Sons | 6,683 | 0 | 0 |
| Porter | 6,655 | 0 | 0 |
| Bollom | 6,600 | 0 | 0 |
| Renshaw | 6,356 | 0 | 0 |
| Fairhead & Son | 6,289 | 0 | 0 |
| Monk | 6,275 | 0 | 0 |
| Mattock Bros. | 6,257 | 0 | 0 |
| Lawrence & Son | 6,172 | 0 | 0 |
| Knight & Son | 6,139 | 0 | 0 |
| Brand, Pettitt & Co. | 6,049 | 0 | 0 |
| Treasure & Son (*recommended*) | 5,991 | 0 | 0 |

### SANDBACH.

For additions to the Grammar school. Messrs. ALFRED PRICE & SON, architects, Sandbach.

| | | | |
|---|---|---|---|
| Jackson | £4,132 | 0 | 0 |
| Brown & Sons | 3,852 | 10 | 0 |
| Birchall Bros. | 3,827 | 0 | 0 |
| Bennett Bros. | 3,800 | 0 | 0 |
| STRINGER, Sandbach (*accepted*) | 3,764 | 0 | 0 |

### SCOTLAND.

For work in connection with the erection of new cookery room for Haddington School Board.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Baillie, mason | £199 | 0 | 0 |
| Dickson, joiner | 180 | 0 | 0 |
| Ross, plumber | 130 | 0 | 0 |
| Lambert, plaster and cement | 44 | 17 | 3 |
| Cumming, slater | 38 | 1 | 2 |
| Coutts & Co., glazier | 32 | 0 | 0 |
| Allan & Co., painter | 28 | 18 | 0 |
| Brown & Clegg, ironwork | 26 | 0 | 0 |

### SOUTHGATE.

For fitting up the chemical and physical laboratories, dark room, balance room, &c., at the Southgate County school, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | | | |
|---|---|---|---|
| Baird & Tatlock | £430 | 0 | 0 |
| Bennett Furnishing Co. | 427 | 2 | 6 |
| Hammer & Co. | 370 | 0 | 0 |
| Wake & Dean | 367 | 17 | 0 |
| Mattock Bros. (*recommended*) | 345 | 0 | 0 |

### TOTTENHAM.

For structural alteration and re-decoration of the Tottenham High School for Girls, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | Alteration. | | | Re-decoration. | | |
|---|---|---|---|---|---|---|
| Porter | £1,079 | 0 | 0 | £461 | 0 | 0 |
| Stewart | 1,000 | 15 | 0 | 371 | 15 | 0 |
| Knight & Son | 1,000 | 0 | 0 | 450 | 0 | 0 |
| Treasure & Son | 997 | 0 | 0 | 520 | 0 | 0 |
| Groves & Son | 985 | 0 | 0 | 374 | 0 | 0 |
| Lawrence & Son | 982 | 0 | 0 | 496 | 0 | 0 |
| Mattock Bros. | 957 | 0 | 0 | 577 | 0 | 0 |
| Brand, Pettitt & Co. | 956 | 0 | 0 | 464 | 0 | 0 |
| Monk (*recommended*) | 887 | 0 | 0 | 322 | 0 | 0 |

For fitting up the chemical and physical laboratories, dark room, balance room, &c., at the Tottenham Polytechnic, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | | | |
|---|---|---|---|
| Bennett Furnishing Co. | £371 | 0 | 0 |
| Baird & Tatlock | 356 | 0 | 0 |
| Wake & Dean | 344 | 19 | 0 |
| Hammer & Co. | 333 | 0 | 0 |
| Treasure & Son (*recommended*) | 330 | 0 | 0 |

### WOOD GREEN.

For fitting up the chemical and physical laboratories, dark room, balance room, &c., at the Wood Green County school for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

| | | | |
|---|---|---|---|
| Baird & Tatlock | £395 | 0 | 0 |
| Bennett Furnishing Co. | 378 | 9 | 5 |
| Wake & Dean | 361 | 7 | 6 |
| Hammer & Co. | 349 | 0 | 0 |
| Mattock Bros. (*recommended*) | 339 | 0 | 0 |

### WALTON (SURREY).

For sewering Hurst Road.

| | | | |
|---|---|---|---|
| E. & E. Iles | £1,421 | 0 | 0 |
| Osenton | 1,359 | 0 | 0 |
| Wimpey & Co. | 1,147 | 0 | 0 |
| Dick, Kerr & Co. | 1,126 | 0 | 0 |
| Jackson | 1,077 | 0 | 0 |
| Kavanagh & Co. | 1,073 | 0 | 0 |
| Free & Sons | 1,040 | 0 | 0 |
| Wheeler & Co. | 931 | 0 | 0 |
| Blaker | 883 | 0 | 0 |
| Potterton & Co. | 858 | 0 | 0 |
| Lane | 772 | 0 | 0 |
| Catley | 680 | 0 | 0 |

### WINCHESTER.

For erection of an aisle and porch at St. Paul's Church.

| | | | |
|---|---|---|---|
| MUSSELWHITE & SAPP, Basingstoke (*accepted*) | £1,776 | 0 | 0 |

## PARK LANGLEY, KENT.

ALTHOUGH it is not quite a year ago since the first sod was turned at this picturesque estate, which is on the outskirts of Beckenham, Kent, there are already some thirty houses in occupation, with more than double this number practically completed.

The estate has been planned by Mr. Reginald C. Fry, of Clifford's Inn, W.C.

It has an area of some 700 acres, and the houses will stand upon a sand and gravel soil at heights varying from 200 to 300 feet above sea-level. Each purchaser or tenant will possess, with his house, a frontage of about 50 feet and a depth of 200 feet.

Gas, electric light, and water are laid on the estate, and the laying out and construction of the roads have been entrusted to a thoroughly competent engineer.

Taking Napoleon's conception of Paris as a model, the centre of the property is occupied by a large circular court, from which broad avenues radiate to the verge of the estate, whilst other roads form outer circles around the centre, in which will be built the shops for the use of tenants.

Messrs. H. & G. Taylor are the proprietors, and the following are a few of the sub-contractors:—Enamel and paints, Messrs. Thos. Parsons & Sons, of Mitcham, Surrey; stoves, Messrs. Bratt, Colbran, The Carron Company, and Brooks, Phillips & Co. The tiles are supplied by The Keymer Brick and Tile Co., Sussex, and Messrs. Tucker & Co., of Loughborough, and the bricks by Messrs. C. H. Norris, Ltd., of Erith, Kent. Messrs. Mander & Co., of Wolverhampton, are doing the oak graining, and the Turk system of drying is being universally employed.

## TRADE NOTE.

THE British Uralite Company (1908), Ltd., announce their removal to more commodious offices at 85 Gresham Street, London, E.C. The Company are able to make an important announcement regarding the regulations made by the various insurance companies, whose regulations are very strict as to the premiums to be charged. On wood partitions where these are protected by Uralite ½-inch in thickness, a reduction in insurance to the extent of 1*s*. per cent. is allowed.

## VARIETIES.

IT is proposed to erect a new public hall in the High Street, Broadstairs.

PLANS have been approved by all the authorities concerned for the enlargement of the Dunfermline and West Fife Infectious Diseases Hospital, at a cost of 10,308*l*.

MR. OSBORNE, architect, Blyth, has prepared plans for a council chamber and municipal offices to be erected at Ashington, at a cost of about 3,000*l*.

A PROJECT is on foot to erect a theatre at Gosforth on a piece of vacant land at the foot of Salter's Road. It is said that the promoters intend making a handsome and up-to-date building.

THE streets committee of the Middlesbrough Corporation on Tuesday decided to rebuild the butchers' market at a cost not exceeding 2,500*l*., and to make provision for sixty-eight stalls. The butchers' market was destroyed by fire in November last.

THE Council of Armstrong College, Newcastle-on-Tyne, have been officially informed of a gift of 10,000*l*., as a memorial to King Edward VII. The money will be devoted to the erection of a new School of Art, towards which the Council will contribute 8,000*l*. and a site.

THE Cardiff public works committee were informed last week that the lowest tender for the erection of a workman's cottage at Lavernock for the use of the valve attendant was 600*l*. Mr. Harpur, city engineer, explained that the high cost was due to the cost of haulage and the increased cost of labour at Lavernock.

THE British Acting Vice-Consul at Dardanelles (Mr. C. E. S. Palmer) reports that an exhibition of antiquities is shortly to be opened at that place. This is the first stage of an attempt to divert the tourist traffic from Karanlik Liman to Dardanelles. If the scheme promises well, the building of an hotel and the improvement of the road to Erenkeni would be undertaken.

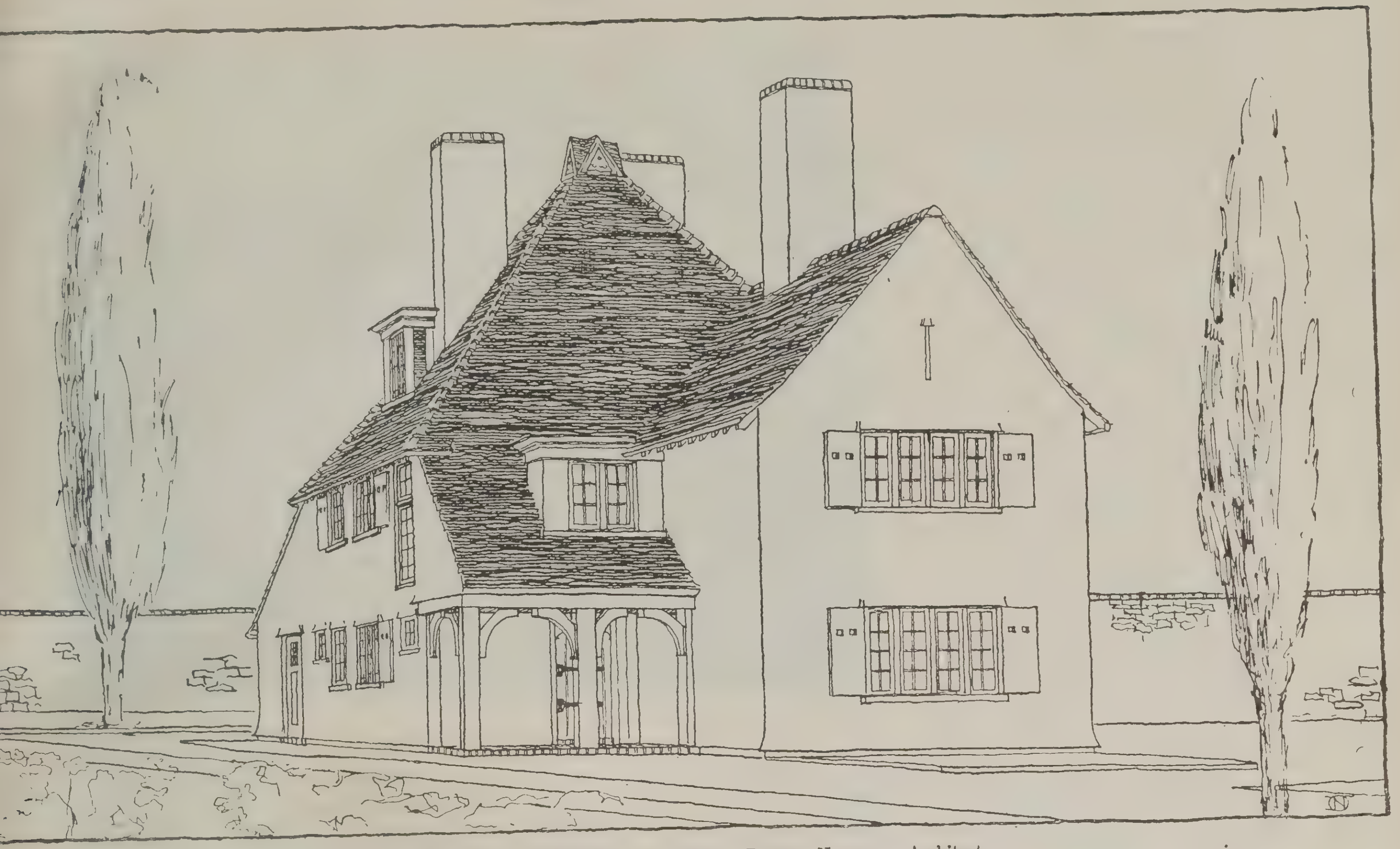
THE Governors of the North Staffordshire Infirmary have decided that structural alterations found necessary should be proceeded with, and an appeal is to be made at once to the public. The late King laid the foundation stone of the Infirmary in 1866, and it is proposed that the new work should be a memorial to his name. It is intended to form an appeal committee with a view to raise at least 35,000*l*.

THE fiction contained in the June number of *Pearson's Magazine* is quite up to its usual standard of interest. A new series of clever, fantastic stories has started under the general title of "Professor Peterson's Experiments." They relate, in a very diverting manner, the peculiar experiences that befell a modern scientist who dabbled in the mysteries of ancient Egypt. Among the contributors to this issue of *Pearson's Magazine* are E. Phillips Oppenheim, Roy Norton, Brinsley Moore, and many other well known writers.

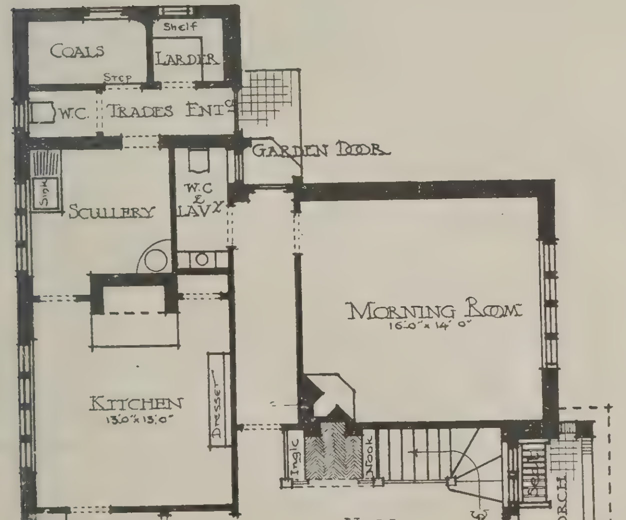
TIVERTON Town Council last week discussed whether there should be an open competition for the plans for the new boys' elementary school. The education committee had submitted as a compromise against the Council's last proposal for open competition, that the competition should be limited to eight architects of repute. Various amendments were proposed, and the voting, after two hours' discussion, was taken. One to confine it to Devon, was rejected. The proposal to throw the competition open to the county, with 50*l*. and 25*l*. premiums, was carried by 11 to 10 votes. Upon this being put as a substantive resolution another amendment was moved that Mr. Ashford (architect, Tiverton Middle schools, now in course of erection) be instructed to prepare plans. This finally became the determination of the Council by 11 votes to 10.

BUILDING in Montreal is very active this year, and the *Builders' Exchange* states that all previous records of that city will probably be exceeded. Including the operations projected by the Canadian Pacific Railway to the extent of $6,000,000, there are now about $12,000,000 worth of railroad, departmental stores, and other business and public buildings being started, under way, or completed. Blocks of dwellings containing a thousand flats are being built in the north end of the city, while unusual activity prevails in all the suburbs in building houses and flats, of which there has for some time been a scarcity in the city. The larger works were mostly projected last year, but during the first four months of the present year permits to the extent of $3,500,000 were issued, being $1,500,000 in excess of the figures for the same period in 1909.

A COUNCIL meeting of the London Master Builders' Association was held on May 26, when the President (Mr. Leonard Horner) took the chair. The Council approved the recommendations made with reference to affiliation fees, and appointed a committee to consider and report upon the question of measurement of slating and roof tiling. Cases were reported where sub-contractors were specified to do work usually done by builders, and action was determined upon in order to check this growing and objectionable practice. Amendments of the agreed form of building contract, proposed by a branch of the National Federation, were considered and referred to the Institute of Builders for consideration. A Parliamentary Bill to amend the law relating to Trade Unions was referred to the parliamentary committee.

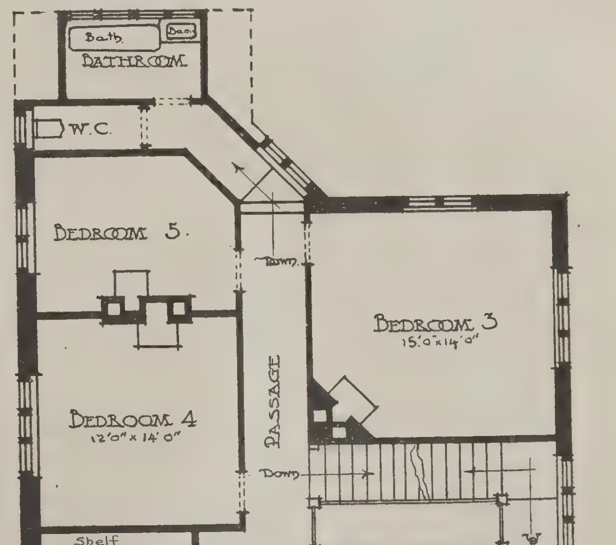


HOUSE IN FERNDOWN, DORSET.—BRYANT NEWBOLD, Architect.



HOUSE IN FERNDOWN - DORSET

~ GROUND FLOOR ~



BY BRYANT - NEWBOLD ARCHITECT

- FIRST FLOOR - -

## POLISHED WOODWORK.

The growing use of polished wood floors has aroused something akin to keen rivalry between housewives as to the quality of surface presented. This apparently simple operation, however, requires something more than good intentions as many of these competitors discovered. Fortunately the Ronuk Company invented a Sanitary Floor Polish, which at once solved the difficulties. Although its use presented no difficulties the company followed up and completed their invention by organising a Polishing Contract Department with a special staff of workmen.

The increasing demand for their services in private houses has led the Ronuk Company to open a new London depot at 16 South Molton Street, W. This showroom, which was opened last week, is panelled in oak, and is a fine example of high-class English joinery. The floor is laid with oak blocks, and both flooring and panelling have been treated and polished by the Company's own staff of workmen. They furnish a striking testimony to the perfection of finish obtained by the "Ronuk" Improved Sanitary Method. The same applies to the heavy oak beams in the ceiling and to all the wood fittings.

The showroom, as will be seen from the accompanying illustration, is entirely unlike a shop. It is furnished with carved oak Jacobean chairs, tables, Persian rugs, with blue and white Delft china on the ledges over the panelling.

## THE CORROSION OF METALS.

Engineers, metallurgists and users of non-ferrous metals will be interested to learn that the Council of the Institute of Metals have decided to undertake an investigation into the causes of the corrosion of non-ferrous metals by sea water, acids, &c., and by other chemical and electrolytic reactions. A committee known as the Corrosion Committee of the Institute of Metals has been appointed for the purpose of carrying out the investigation. The following are the names of the gentlemen constituting the committee:—Sir Gerard Muntz, Bart., chairman of the committee (president of the Institute of Metals); Professor H. C. H. Carpenter, M.A., Ph.D. (of the University of Manchester); Engineer Captain G. G. Goodwin, R.N. (Deputy Engineer-in-Chief, Royal Navy); Professor A. K. Huntington, Assoc.R.S.M. (King's College, London); Mr. J. T. Milton (Chief Engineer Surveyor, Lloyd's Register of British Shipping); Mr. A. Philip, B.Sc., Assoc.R.S.M. (Admiralty Chemist); Mr. Leonard Sumner, M.Sc. (of the Broughton Copper Co., Ltd.); Professor T. Turner, M.Sc. (of the University of Birmingham); Sir William H. White, K.C.B., F.R.S. (Past-President of the Institute of Metals).

The first meeting of the committee was held at the offices of the Institute, Caxton House, Westminster, S.W., on May 24, all the members being present with the exception of Sir William White, who has just left for a visit to the United States of America. Realising the magnitude of the task before them, and the vast number of ramifications to which such an investigation must lead, the committee have decided in the first instance, to confine their attention to the question of the corrosion of condenser tubes in marine engines and in stationary engines using foul water or being subject to violent electrolytic action such as often occurs in electric power stations. Before commencing experimental research the committee propose to have prepared an epitome of such information on the subject as is already available from previous research in the same direction. Mr. G. D. Bengough, M.A., of the Metallurgical Department of the University of Liverpool, has been asked to undertake this work and to become a member of the committee. On the completion of the work by Mr. Bengough, it will be submitted to the committee, who will then consider what steps shall next be taken in the matter of further investigation and experimental research, with a view to elucidating the various mysteries of corrosion which are the source of so much trouble and anxiety both to users and manufacturers of articles composed of copper and its alloys.

Professor H. C. H. Carpenter, M.A., Ph.D., of the University of Manchester, whose work for the Alloys Research Committee of the Institution of Mechanical Engineers, is so well known and highly appreciated, has kindly undertaken to act as honorary secretary to the committee.

The result of the committee's researches will be at the disposal of the members of the Institute of Metals, which already includes in its membership most of the leading manufacturers and users of non-ferrous metals, and doubtless those who have not as yet thought it worth their while to associate themselves with the Institute, will in view of the useful and most important work which it has now initiated be anxious to join its ranks. This trouble of corrosion is one which has long given infinite cause of annoyance and anxiety to all who have to deal with non-ferrous metals, and above all to marine engineers, and it cannot fail to be a matter of general congratulation amongst engineers that the solution of the problem has now been undertaken seriously by a body so competent to deal therewith as the Institute of Metals, which comprises within its membership makers, users and scientists, and, therefore, has at its disposal information such as no other body possesses or could hope to possess.

The annual general meeting of the Cardiff, South Wales and Monmouthshire Architects' Society was held in their room, No. 6 High Street, Cardiff, on the 30th ult., when Mr. Cecil L. Wilson, F.R.I.B.A., was elected president for the ensuing year. Other officers and members of the Council were also duly elected. The accounts of the Society were shown by the hon. treasurer to be in a very satisfactory condition, and a report was read by the hon. secretary recording the various exhibitions of drawings held in the Society's room, the visits paid by members to works under construction, &c., and other matters of business transacted by the Society during the past twelve months. Various suggestions were made as to the future work of the Society, and there is a good prospect of interesting outings during the coming summer, and of instructive papers to be read at the winter's meetings.

The Hexham Urban Council held an extraordinary meeting on Monday to reconsider last week's decision regarding the purchase of the Abbey grounds. The Chairman read a letter from the Benson family of Allerwash, offering an additional 500*l*. to their gift of 1,000*l*. towards the purchase of the grounds. A petition signed by leading townsmen was also received guaranteeing 500*l*. After discussion, a resolution was unanimously carried that, subject to the Local Government Board's approval, the Council agree to purchase the Abbey grounds from Lord Allendale for 6,000*l*. The grounds, which are 5¼ acres in extent, are beautifully timbered, and are adjacent to Hexham Abbey.

## FUNDAMENTAL CONSIDERATIONS IN ENGLISH TOWN PLANNING.*

(*Concluded from last week.*)

It seems quite fitting that municipalities should watch over the evolution which day by day seems to be more and more necessary. Entrusted with the administration of the general interests of the community, the municipality seems better fitted than any other body in the State to know what is necessary to the well-being and future welfare of the inhabitants of the city.

It will be a great illusion to expect that much light and leading will be given in these questions by Central State Departments. It is true that the central authority ought to trace the direct lines of the movement and, by passing laws (having as much elasticity as possible), should indicate the general methods to be applied. When, however, the State is not content with this high mission and undertakes to foresee and to determine in the most minute details the conditions to be imposed on muncipalities, a condition of affairs is created which involves the destruction of local initiative.

Such a State policy strikes at the best traditions of the local life of counties and of provinces. It destroys that local patriotism which is the most solid feature in building up national patriotism.

Each country should adopt general methods of municipal administration. The application of these methods should, however, be determined by local conditions and the needs and customs of the people. From the point of view of town-extension planning it would be a great mistake for one country to adopt purely and simply in all details a method which has given certain results in another country. In this relation it must be urged that the methods of town-extension planning which have accomplished so much in Germany do not seem to be applicable to Great Britain.

Without seeking to examine the motives of those who today are in Germany building up colossal fortunes on land speculation at the expense of the community (a fact which seems to be unrecognised in Germany), we must recognise that the great German cities are being forced in a path of development absolutely beyond measure and under conditions which nothing can justify. The insatiable desire to increase at all costs the size of their towns carries with it the germ of great reaction in the future. To an intelligent observer there would seem to be a kind of mutual understanding between a certain category of land speculators and the interests of great bankers, who under the pretext of public health see in this aggrandisement of the towns an opportunity of increasing the value of the land and the obtaining of enormous great profits as a result. One would hardly care to state in Germany the figures of enormous gains already secured in the great cities as a result of their town-extension plans. The city of Ulm, however, seems to have found the right land policy, thanks to the Oberburgermeister, Herr Otto Wagner, who for eighteen years has been at the head of the municipality.

The goal of town-extension plans should be above all the betterment of the housing conditions of the great mass of the people. Generally speaking, in the great cities of Germany which have adopted town-extension plans the Housing Societies which occupy themselves with the task of providing workmen's houses are not yet strong. They have the greatest possible difficulty in extending their operations in face of the private syndicates of land speculators. These syndicates have secured in advance all possible land profits, and by preventing these Housing Societies from securing cheap land have directly attacked the health and the happiness and the life of the people.

In Great Britain, with your eminently practical spirit—a spirit without prejudice and above all anti-theoretical—you have an opportunity of finding a rational solution in this question of town-extension planning. As I have already pointed out you are in a specially favourable situation. Your condition compares favourably with that of Germany, in which the municipalities will sooner or later find themselves in great difficulties as a result of the great increase in land values.

In France the situation is of another kind. The great number of small owners of land, a consequence of that "régime de liberté" which is one of the glories of France, renders the preparation of town extension plans a very difficult task, and it is necessary, therefore, that we should adopt a wide range of methods in solving our problem. None of these difficulties exist in Great Britain. It may also be said that—compared with Germany—great land speculation is non-existent with you as a result of the fact that the few great landlords are not free to sell their land. These circumstances which are to-day so favourable to you ought to render it possible for you to develop a method of town-extension planning which should be almost a perfect one, and which should in the future make the cities of Great Britain the modern cities "par excellence."

Your plans of town extension must moreover be carefully safeguarded against the adoption of projects which are too monumental. This perhaps is one of the leading characteristics of German thought to-day—and seems bound to lead the great cities of Germany by steady steps in the downward path to great municipal deficits.

It is not by providing perspectives and grandiose monuments that we shall make our cities healthy and our people happy. This method of planning simply creates in the public mind a false conception of grandeur—a grandeur not related to simple life and to home life.

That which the cities of Great Britain should in the future strive to attain is such a solution of this problem as shall secure public roads which shall be beautiful and pleasant, but above all economical in construction and maintenance. Great Britain has already given Europe many good examples in this field of work. It is necessary that you should develop your town extension work along this same line.

In my opinion, the garden city should be regarded as an ideal to which the older towns should endeavour to mould their developments even though they cannot hope to secure this result. It is above all things necessary in England to create a strong public opinion against the Americanisation of your towns—a tendency which in Continental cities there is such a desire to follow. There should be a peaceful war waged by those who are disinterested advocates of town planning against the block dwelling, and all advocates of better housing conditions should be together in this fight.

You with your national tenacity of purpose should remain faithful to the small house—the house for one family. By the adoption of the zone system you will be able to concentrate the buildings for commerce and for manufacture in certain districts clearly outlined in advance and subject to special rules regarding height of building, &c.

In the other parts of the city each citizen must be able to establish his home—the nest of the family, the loved dwelling in which the children are born and grow up. Your towns must refuse to permit the erection of block dwellings—the worst infliction of modern life.

One of the dominant features of English life—one of the traits which affect so vitally the temperament of your people —is the love of nature, a love instilled into your people from the earliest age. This love of nature is expressed in the strong desire to have a garden to cultivate, the love for flowers in windows and flowers in the rooms. On seeing a little country cottage one is struck with the care shown in the cultivation of plants. It would seem that with you the affection for flowers is almost equal to the affection for your fellow creatures.

There is nothing really more beautiful than the real English country cottage. Surrounded by verdure it takes harmonious form. The small windows seem to be set in a frame of climbing plants. As for the garden it seems almost a living poem. It would seem as if in the English garden nature had been caressed by the human hand. The little porch over which hang the climbing roses, the arbour on which the honeysuckle climbs, together make a setting which seems to make life well worth living. The human man finds himself in his proper setting in possessing his garden, his plants, or his flowers and his fruits.

Let us here realise that it is because the garden is lacking in the towns that life is so abnormal and men give themselves more and more up to the desire for alcohol and for unhealthy distractions.

The moral influence of the garden is considerable. It commences in the earlier years of life and is manifested in the joy which the child shows when it sees around it the marvels of nature. Place a group of ordinary children in a big room, even a great room, and in a little time you will hear the noise of quarrels and even of blows. Place the same band of youngsters in a garden and the quarrels are transformed into cries of pleasure. All is before them, the joy of life, the playing in fresh air, the interest in flowers, herbs, plants and insects.

Give these children a small plot of garden to cultivate and you will see how closely they watch the growth of each plant, and with what joy they bring the first fruits of their garden to you.

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* A paper entitled "Consideration of the Fundamental Conditions which should govern Town Extension Planning in Great Britain." Prepared for the National Town Planning Council by Monsieur Augustin Rey, Architecte, Paris, Membre du Conseil supérieur des Habitations à Bon Marche, Corresponding Member of the International Committee on Tuberculosis.

After all the child is the "father of the man," and it will be right to say that the man is only a child with an added number of years. His tastes are modified in course of time, but do not change in reality.

The workman bends down over his tools all the day, and he becomes enervated and his temper suffers. The noise and the absence of fresh air all affect his nervous system. He goes in his leisure hours to an unhealthy public house and endeavours to find there forgetfulness of his daily labour.

Give him a garden and he becomes cheerful, his chest expands under the influence of the pure air. Bending over his spade he looks with pleasure at the "mother earth" which will render to him in vegetables, in flowers, and in fruits all that which he has given to it in labour. The attraction of unhealthy pleasures disappears as if by enchantment before the irresistible attraction of the earth. The earth on which he is born, which gives to him a long life and subsistence, and to which he will go for his last long sleep—it is this earth to which belongs all life, this earth which men ought to cultivate, which men love to cultivate and which gives back in joy and fertility all men's hours of labour.

Let men have a foothold on the earth and you will find yet again the right equilibrium between the physical and moral. The life of overcrowded cities kills them morally and atrophies the love of men for the land. Nature, if only we will love it a little, can give all health, joy, and happiness, and from it the human family can obtain by daily labour the means of life.

The child grows strong in the garden, the man seeks his rest there, and the housewife seeks there the food which will help her in the economies of her household. It is for this reason necessary that we should carry all we can of country life into the town and place around the dwelling of the workman that verdure which constitutes the true ornamentation and the most beautiful of all ornamentation for our modern cities.

Great Britain will do well to remain the country which has most fully preserved the cottage with the garden. You are not yet invaded with the block dwellings, which are veritable "Hades" for the workmen's families, and which slowly degrade and throw out of equilibrium the health and happiness of the people.

Who has not had under his eyes the picture of the squalid little home overcrowded with children without proper place to play? Obliged to continually interfere in the children's quarrels, living in a closely confined dwelling, badly designed, the wife loses her temper. The father comes home to an overcrowded dwelling of crying children and bad-tempered wife, and his only idea is to escape from it all to the nearest public house.

All this can be changed in the cottage. The children can have their proper place to play, and the mother can give her attention to the home.

Let me, therefore, most strongly urge you in elaborating your extension plans to conserve and increase your English cottages. The other countries must follow you in the path of progress as opportunities come to them. The work of developing the cottage life of the people will be a work much more lasting for the happiness of the people than the unhealthy aggrandisement of towns which waste the health of the people and only secure grandiose and monumental features.

I come now to the last point of my paper, which is that the most practicable means of giving to a town extension plan an indisputable hygienic value is to be found in the limitation of the number of persons per acre. This method ought to be taken as a fundamental principle to be recorded in every local law in Great Britain, in order to completely avoid the overcrowding of dwellings and the shutting out of air and the light from dwellings.

If this vital principle be adopted the good results of town-extension planning will be widespread and even in the old quarters of a town, overcrowded and unhealthy as they are, their final depopulation and clearance will follow. It is absolutely necessary to bring home to the human conscience the truth that the human bees were not made to be placed one above another but to live spread out on the surface of the earth. It is the destiny of man to profit by the fruits of the earth and to enjoy the vegetation which has been created to give him pure air to breathe in order that he may procure subsistence and maintain in equilibrium his physical and moral condition.

Finally, let me summarise in the following paragraphs that which seems to be the most essential for you to obtain in this great country in regard to town extension, viz. your policy on this question of the land. You have great enterprise and should succeed. Great Britain is ready for such a policy, and by her happy destiny she can succeed in a great reform—a reform without which no other reforms can be regarded as complete.

### A LAND POLICY FOR TOWN PLANNING.

1. *The Purchase of Land by Municipalities of the Towns.*—By a law of the State all the cities of Great Britain should have special privileges to buy land (and if necessary all the land), whether situated in their boundaries or in a wide suburban area.

2. *The Purchase of Land by Annuities.*—In order not to overburden the budgets of the municipalities the purchase of such land, the price of which should be fixed by special commissioners, should be payable by annuity bonds.

3. *Land thus acquired by Municipal Authorities should never be Sold but Let.*—The land thus included in the municipal possessions should never be sold, but let for building on long leases with special clauses limiting the number of houses to the acre, prescribing conditions in regard to rent and providing specially for the construction of suitable dwellings for the people.

4. *Conditions for Future Land Purchase.*—In all future purchases the price of land for the widening of public roads and for procuring sites for public buildings should be in a direct relation to the value of the land already acquired for the purpose of town planning.

## ALEXANDRA WHARF.

To the great majority of our readers Alexandra Wharf, Tidal Basin, Victoria Docks, E., is well known by name, and many of them are acquainted with it, and the proprietors, Messrs. Hahn & Co., from visits paid to the Wharf for the purpose of inspecting the enormous stocks to be found there, which comprise every variety of Foreign Hardwood. These necessarily form but a small proportion of Messrs. Hahn & Co.'s numerous customers, who in most cases are content to leave to them the filling of their orders.

A short description, therefore, of the Wharf and its stocks, as seen by us on a recent visit, will doubtless prove of interest.

Alexandra Wharf occupies an important position on the Thames, and covers an area of four acres, having a depth of 900 feet, and a river frontage of 200 feet, where cargoes can be received at all states of the tide.

A light railway runs from the river frontage round the Wharf, and, by it, stocks being received are promptly conveyed to that part of the Wharf in which is stored the particular kind of Hardwood being discharged. A Railway Siding running into the Wharf enables trucks to be loaded expeditiously and despatched direct to all parts of the country. It will be seen, therefore, that Alexandra Wharf in area, in facilities for unloading and despatching, occupies an extremely favourable position.

But still more important to the user of Hardwoods must be the extent and quality of the stocks to be seen there, their condition, whether thoroughly seasoned, and country of origin. He cannot fail to have his attention immediately arrested by the immense stock of Wainscot Oak, of which there are no less than 6,000 logs, the pick of the Forests of Austria and Russia. Further, they are bone-dry and ready for immediate use, whether for constructional work in Churches, Public Buildings, &c., or for Bank or Shop Fittings.

Logs of Mahogany, Teak, Birch, Walnut, &c., thoroughly dry, are there also in large quantities, the selection of Mahogany being exceptionally fine.

All these Hardwoods are seasoned by natural means, artificial drying having no place on Alexandra Wharf. A special section of the Wharf is devoted to manufactured Oak, Maple, and Teak Flooring, the extent of the stock being quite in keeping with the other sections.

Within the last few weeks there has begun that improvement in the Building Trade so long hoped for, and there is every indication of it not only continuing but steadily increasing. It behoves the user of Hardwoods to take care that his stock is replenished while the present low prices continue, otherwise he will undoubtedly be obliged to make his purchases in the near future at higher rates.

SOUTH POLE EXPEDITION.—Messrs. Robert Boyle & Son, ventilating engineers, 64 Holborn Viaduct, have supplied the ventilators for the iron huts to be used in connection with Captain Scott's expedition to the South Pole.

THE
# Architect and Contract Reporter.
FRIDAY, JUNE 10, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

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*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

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*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

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## TENDERS, ETC.

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## COMPETITIONS OPEN.

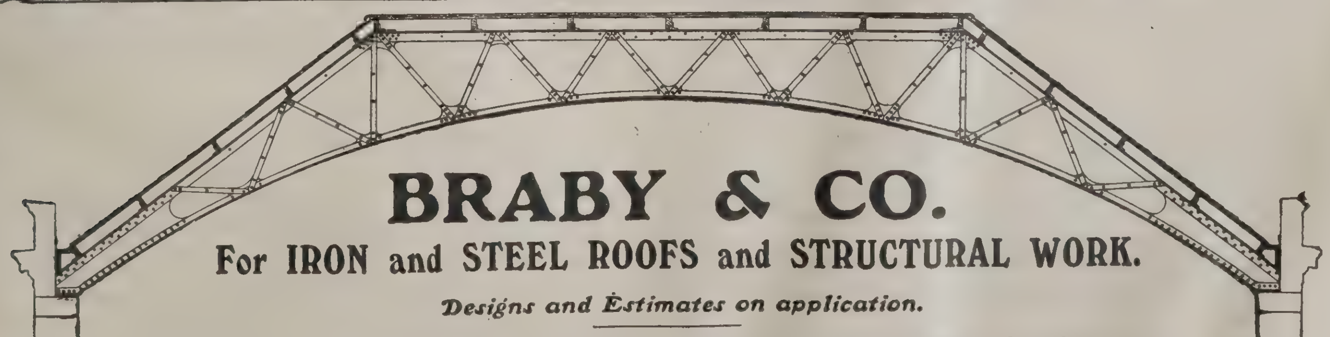
Ashton-on-Mersey.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

Belfast.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l*. Assessor, Sir Aston Webb, R.A. Two premiums of 150*l*. and 100*l*.; particulars 2*l*. 2*s*., returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Edinburgh.—July 9.—The Corporation invite designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

London.—June 15.—The Acton Urban District Council invite plans for schools at Rothschild Road for 850 pupils. Premiums of 100*l*., 50*l*., and 25*l*. are offered, but any premium awarded to the successful architect shall be merged in his commission of 3½ per cent. Deposit 10*s*. 6*d*. Apply after April 5 to Mr. F. A. Everitt, secretary, Education Department, Council Offices, Acton, W.



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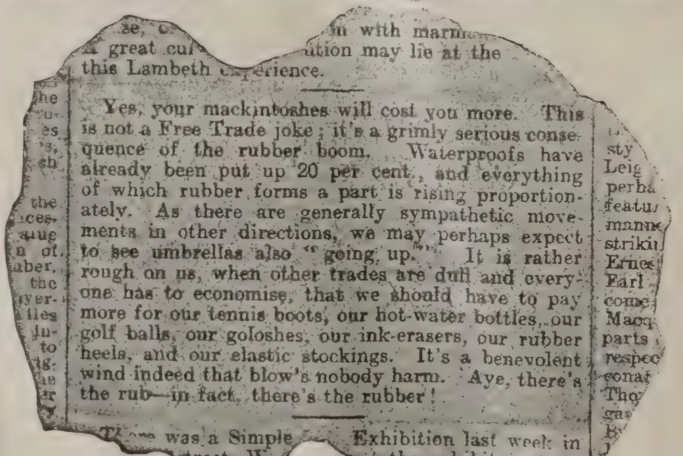
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Yes, your mackintoshes will cost you more. This is not a Free Trade joke; it's a grimly serious consequence of the rubber boom. Waterproofs have already been put up 20 per cent., and everything of which rubber forms a part is rising proportionately. As there are generally sympathetic movements in other directions, we may perhaps expect to see umbrellas also "going up." It is rather rough on us, when other trades are dull and everyone has to economise, that we should have to pay more for our tennis boots, our hot-water bottles, our golf balls, our goloshes, our ink-erasers, our rubber heels, and our elastic stockings. It's a benevolent wind indeed that blow's nobody harm. Aye, there's the rub—in fact, there's the rubber!

was a Simple Exhibition last week in street, W. the exhibits was a

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## CONTRACTS OPEN.

Adwick-le-Street.—June 29.—For erection of a mortuary chapel, caretaker's house, and board-room for the Adwick-le-Street Burial Board, Doncaster. Mr. John Simmons, C.E., architect, Bank Chambers, Doncaster.

Bacup.—June 23.—For erection of a post office at Bacup. Deposit 1*l.* 1*s.* The Postmaster of Bacup, or H.M. Office of Works, Storey's Gate, London, S.W.

Barnstaple.—June 16.—For rebuilding a portion of No. 94 Boutport Street. Mr. J. C. Southcombe, architect, Barnstaple.

Belfast.—June 23.—For erection of a disinfecting station in Lagan Bank Road. Deposit 3*l.* 3*s.* The City Surveyor, Belfast.

Bellingham.—June 17.—For the construction of boundary wall to enclose one acre of ground for a cemetery at Falstone, for the underdraining of the site, and for the laying out and construction of footpaths in connection therewith. Mr. R. E. Riddle, surveyor, Percy Terrace, Bellingham, Northumberland.

Bewcastle, near Carlisle.—June 17.—For the mason work required in erection of a girder bridge at Bailey Mill, Bewcastle. Mr. James Murray, surveyor, Kirklinton, Carlisle.

Birkenhead.—June 13.—For plastering three wards at the Union Infirmary, Church Road, Tranmere. Mr. John Carter, clerk, Poor Law Offices, Birkenhead.

Birkenhead.—June 14.—For building repairs at the Guardians' stable and yard, Oliver Street, Birkenhead. Mr. John Carter, clerk, Poor Law Offices, Birkenhead.

Brownhills.—June 15.—For erection of house at the Council's sewage pumping station at the Mosspits, Sheffield, for the Brownhills Urban District Council. Mr. J. H. Shaw, surveyor, Council Offices, Brownhills, Staffs.

Chadderton.—June 18.—For erection of wash-houses, &c., in connection with the caretakers' house at Eustace Street and Stanley Road schools. Mr. J. Whitehead, clerk to the committee, Education Offices, Chadderton, Lancs.

Chartham Downs.—June 17.—For the repairs, plastering, painting, &c., to Ward A 2 Female at the Kent County Lunatic Asylum, Chartham Downs, near Canterbury. Deposit 5*l.* Mr. W. J. Jennings, architect, 4 St. Margaret's Street, Canterbury.

Chester.—June 13.—For building a fire-station at the premises in Northgate Street. Deposit 1*l.* Mr. James Strong, architect, 11 Dale Street, Liverpool.

Chislehurst.—June 15.—For erection of a post-office. Deposit 1*l.* 1*s.* The Postmaster, Chislehurst. H.M. Office of Works, Storey's Gate, London, S.W.

Chopwell.—June 11.—For erection and completion of house and two shops at Chopwell, Durham. Mr. D. M. Spence, architect and surveyor, Shotley Bridge.

Copmanthorpe.—June 16.—For the construction of a water tower built in brickwork, and the providing and erecting of a cast-iron water tank having a capacity of 4,500 gallons, and other works in connection therewith, at Copmanthorpe, Yorks, for the Bishopsthorpe Rural District Council. Deposit 1*l.* 1*s.* Messrs. Fairbank & Son, M.I.C.E., Lendal Chambers, York.

Craghead.—June 21.—For erection and completion of a church at Craghead, S.O., Durham. Deposit 1*s.* 1*s.* Mr. Jas. W. Thompson, architect, 63 Grey Street, Newcastle-on-Tyne.

Dalton Parva.—June 23.—The West Riding Small Holdings Committee invite whole or separate tenders for the following work:—New buildings and alterations and additions to existing buildings in connection with adaptation of farm buildings at Dalton Parva (near Rotherham)—builder, joiner, slater, plumber, plasterer, painter. The West Riding Architect, County Hall, Wakefield. Send 1*l.* 1*s.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Darlington.—June 14.—For converting paint shop into power house at Darlington, for the North-Eastern Railway Co. Mr. William Bell, the company's architect at York, or the Station Master, North Road Station, Darlington.

Devizes.—June 28.—For the erection of waiting-rooms, footbridge, and verandah at Devizes Station, Wilts. The Engineer, Great Western Railway Station, Bristol.

Durham.—June 14.—Sole tenders are required by the Durham Education Committee (1) for alterations and additions at Black Boy Council school; Mr. F. H. Livesey, architect, Newgate Street, Bishop Auckland; (2) for alterations and additions at Eldon Council school and caretaker's house at Murton Colliery; Mr. F. E. Coates, Shire Hall, Durham; (3) for manual instruction room at Cockton Hill; Mr. W. Rushworth, Shire Hall, Durham.

Edinburgh.—June 15.—For the following works in connection with the erection of a supplementary school on the M'Leod Street site, viz.:—(1) Mason and brick works; (2) carpenter, joiner, and glazier works; (3) steel and smith works; (4) plumber work; (5) slater work; (6) plaster and concrete works; (7) painter work. Mr. J. A. Carfrae, architect, 3 Queen Street, Edinburgh.

Edinburgh.—June 15.—For the following works in the enlargement of London Street Schools:—(1) Mason work; (2) carpenter and joiner works; (3) steel and ironfounder works; (4) plumber work; (5) plaster work; (6) painter work. Mr. J. A. Carfrae, architect, 3 Queen Street, Edinburgh.

Farnham.—June 21.—For certain repairs to be executed to Tilford East Bridge. Deposit 10*s.* 6*d.* Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Farnham.—June 21.—For erection of proposed cottages at their Ash and Hindhead depôts, for the Farnham Rural District Council. Deposit 10*s.* 6*d.* for each cottage. Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Footscray.—July 4.—For the enlargement of Langlands Council school at Footscray, Kent. Deposit 1*l.* Apply after June 13 to Mr. W. H. Robinson, M.S.A., architect to the Kent Education Committee, Caxton House, Westminster, S.W.

Greenside.—June 18.—For the several works required in erection of new club premises at Greenside, near Ryton-on-Tyne. Workmen's Club, Greenside, or Mr. T. E. Taylor, architect and surveyor, Lanchester (also Annfield Plain).

Guildford.—June 18.—For certain decorative work and repairs to the elementary schools. Mr. C. G. Mason, A.M.I.C.E., borough surveyor, Tuns Gate, Guildford.

Halifax.—June 16.—For the various works in connection with alterations and additions to Salterville, Skircoat. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Halifax.—June 23.—For the various works required in erection of eight dwelling-houses, &c., in Lemington Avenue. Messrs. Medley Hall & Son, architects, 1 Harrison Road, Halifax.

Hampton Bishop.—June 14.—For alterations to vestry, and repairs to St. Andrew's Church, Hampton Bishop, Herefordshire. Also schemes and tenders for warming the church by low-pressure hot water. Messrs. Groome & Bettington, architects, Palace Chambers, Hereford.

Hull.—June 15.—For erection of a park-keeper's lodge in the Pickering Park. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Ireland.—For the erection and completion of a new college at Galway. Deposit 5*l.* 5*s.* Mr. W. A. Scott, A.R.I.B.A., M.S.A., architect, 45 Mountjoy Square, Dublin.

Ireland.—June 18.—For erection of a combined hall and school at Aghadowey Presbyterian Church. Mr. S. J. M'Fadden, C.E., architect, Queen Street, Coleraine.

Ireland.—June 20.—For erection of business premises at Newtownards. Mr. Thos. Houston, architect and civil engineer, King's Court, Wellington Place, Belfast.

Ireland.—June 21.—For repairs, alterations, &c., at Tomregan Church, Ballyconnell. Rev. M. W. Rogers, rector Tomregan Church, Ballyconnell, Co. Cavan.

Kendal.—June 15.—For alterations to house, Queen's Place. Mr. Malcolm G. Shaw, architect, 45 Highgate, Kendal.

Leeds.—June 20.—For the erection of workshops for the Gas Department in Sovereign Street. Deposit 3*l.* 3*s.* Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Leeds.—June 22.—For the demolition of the old buildings, levelling, and excavating the site, and the formation of main roads and main drains at Beckett's Park, Headingley. Deposit 2*l.* 2*s.* Send names by June 13 to Mr. James Graham, secretary for education, Education Department, Calverley Street, Leeds.

Leyton.—June 28.—For the construction of underground conveniences in High Road, Leytonstone. Mr. William Dawson, M.I.C.E., Town Hall, Leyton.

London.—June 20.—For supply and erection of certain iron buildings, and for the brickwork and concrete foundations thereof, for the Poplar Borough Council. The Borough Surveyor, Council Offices, High Street, Poplar, E.

London.—June 16.—For the Money Order Department building, Holloway, N., second contract (consisting of the brick and stone works, &c., of the front elevation). Mr. John Rutherford, H.M. Office of Works, 22 Carlisle Place, S.W.

London.—June 16.—For repairs and decorative work at the Children's Homes, 180 and 182 Peckham Rye, S.E. Deposit 5*l.* Mr. E. Pitts-Fenton, clerk, 283 Tooley Street, S.E.

London.—June 20.—For the following works, for the West Ham Education Committee, viz.:—Cleansing, repairs and painting of thirteen schools, new covered playground at one school, and installing electric light at three schools, to be executed during the summer vacation. Send 1*l.* 1*s.* deposit by June 11 to Mr. William Jacques, A.R.I.B.A., architect to the Education Committee, 2 Fen Court, Fenchurch Street, E.C.

London.—June 21.—For erection of extensions to the Public Offices, &c., consisting of public health, education, and other offices, also public mortuary, &c., for the East Ham Corporation. Deposit 7*l.* 7*s.* Mr. A. H. Campbell, M.I.C.E., borough engineer, Town Hall, East Ham.

London.—June 23.—For providing and laying pitch-pine floor, plastering walls, and decorative work to wards Nos. 8, 16 and 17 of the infirmary, Marloes Road, Kensington, W. Mr. W. R. Stephens, clerk, Guardians' Offices, Marloes Road, Kensington, W.

Macclesfield (Chester).—June 22.—For alterations to sanitary blocks in the main building at Parkside Asylum. Deposit 1*l.* Mr. H. Beswick, county architect, Newgate Street, Chester.

Malling.—June 21.—For repairs to the Mereworth parish cottages. Mr. C. Souter, Myrtle Villa, West Malling, Kent.

Midhurst.—June 27.—For alterations and additions to the Midhurst Grammar School, West Sussex. Send 1*l.* 1*s.* deposit by June 12 to Mr. Haydn P. Roberts, A.R.I.B.A., county education architect, Horsham.

Newburn-on-Tyne.—July 2.—For erection of proposed police station at Newburn-on-Tyne. Whole tenders. Forward names, together with a cheque for 2*l.* 2*s.*, by June 11 to Mr. J. A. Bean, county architect, Moot Hall, Newcastle-on-Tyne.

Newcastle.—June 21.—For the erection of a single storey shed about 150 feet long and 70 feet wide, and alternative tenders for a shed about 240 feet long and 70 feet wide in connection with the Quay extension. Send 2*l.* 2*s.* deposit to the City Treasurer, Town Hall, Newcastle-on-Tyne. General conditions, &c., at the City Engineer's Office.

Newhey.—June 13.—For erection of an elementary school for 350 scholars at Newhey, near Rochdale. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

New Malden.—June 30.—For erection of Church schools at Kingston Road. Messrs. Vincent Davison & Nicol, architects, Coombe Chambers, New Malden.

Oswaldtwistle.—June 25.—For the erection of a school in Union Road, Oswaldtwistle, near Church railway station. Deposit 2*l.* Mr. Henry Littler, 16 Ribblesdale Place, Preston.

Richmond (Yorks.).—June 21.—For erection of public lavatories in the Ronaldshay Recreation Ground. Mr. H. W. Marsden, borough surveyor, Tower Street, Richmond, Yorks.

Romsey.—June 16.—For building a concrete wall surmounted by an iron fence, and for other work at the Abbey Water. The Borough Surveyor, Market Place, Romsey, Hants.

Scotland.—June 15.—For painter, joiner, plumber, slater, and mason works for the various schools, for the Greenock (Burgh) School Board. The Clerk of the Board, Greenock.

Scotland.—June 15.—For erection of a new orchestra at the United Methodist Church, Troon. Mr. Joseph Rodda, Treslothan Road, Troon.

Scotland.—June 15.—For additions and alterations to the Post Office, Johnstone, Renfrewshire, in one contract. Deposit 1*l.* 1*s.* The Postmaster, Johnstone, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—June 18.—For mason, joiner, plumber, slater, plaster, and painter works in connection with the enlargement of the Fort William primary school, for the Kilmallie School Board. Mr. James G. Falconer, architect, Fort William.

Scotland.—June 20.—The North Berwick School Board are prepared to receive separate offers for mason, joiner, slater, plumber, and plaster works and heating apparatus for proposed additions to High School, North Berwick. Mr. James S. Richardson, architect, 14 Randolph Place, Edinburgh, or Mr. A. D. Wallace, solicitor, North Berwick.

Shrewsbury.—June 13.—For the erection of public abattoirs, Roushill. Send 2*l.* 2*s.* deposit before June 13 to Mr. A. E. Williams, architect and surveyor, County Chambers, 12 High Street, Shrewsbury.

Tadcaster.—June 14.—For the following work, for the West Riding Standing Joint Committee, viz.:—Conversion of Tadcaster old police station into two cottages. West Riding Architect, County Hall, Wakefield.

Tendring.—June 20.—For erection of a reception home for children at the workhouse at Tendring, Essex. Mr. G. H. Page, architect, Trinity Chambers, Colchester.

Torksey.—June 11.—For the erection of an engineer's cottage at the pumping station, for the Notts Court of Sewers. Mr. W. Southall, architect, Chapelgate, Retford.

Treviscoe (Cornwall).—July 2.—For proposed Wesleyan Methodist church, near St. Stephen's, Grampound Road, Treviscoe. Mr. Sampson Hill, architect, Green Lane, Redruth.

Wales.—June 13.—For erection and completion of school premises, for the Trustees of the Wesleyan Chapel, Sketty, Swansea. Deposit 1*l.* 1*s.* Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

Wales.—June 14.—For railings, gates, gate standards, &c., and repairs to boundary walls, of Bethania Baptist Chapel, New Dock. Mr. D. L. Jones, architect, Thomas Street, Llanelly.

Wales.—June 14.—For erection of two public urinals, each with four stalls, with brick work, sanitary fittings, drainage, &c., at Abertridwr; also for painting various structures and appliances throughout the district, for the Caerphilly Urban District Council. Deposit 1*l.* 1*s.* Mr. Alfred O. Harpur, engineer and surveyor, Council Offices, Caerphilly.

Wales.—June 15.—For alterations of Penrheolgerrig infants' school, and for the erection of new infants' school at Darren View, Penyard. Deposit 2*l.* 2*s.* for each contract. Send names in writing for each school to the deputy surveyor, Town Hall.

Wales.—June 15.—For alterations to laundry at the Cottage Hospital, Porth. Mr. Jacob Rees, architect, Pentre.

Wales.—June 16.—For erection of new Conservative working-men's club at Mardy. Deposit 1*l.* 1*s.* Mr. T. R. Leyshon, secretary, Conservative W.M. Club, Mardy.

Wales.—June 17.—For the following works, for the Rhondda Urban District Council, viz.:—(1) Building of river wall at Hafod school, and (2) building of boundary walls and alterations to windows at Cwmclydach school. Deposit 1*l.* 1*s.* Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

Wales.—June 21.—For erection of a police station at Tintern, Mon. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Tintern, Mon.

Wales.—June 24.—For the construction of the necessary buildings, for the Merthyr Central Laundry Co., Ltd. Mr. C. M. Davies, M.S.A., 112 High Street, Merthyr Tydfil.

Wales.—June 27.—For erection of an additional pavilion, together with other work, at the Mardy Isolation Hospital, Merthyr Tydfil. Deposit 2*l.* 2*s.* The Borough Engineer, Merthyr Tydfil.

Waterloo.—June 20.—For the erection of the Crosby Road North Council School, Waterloo, near Liverpool. Deposit 1*l.* 1*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Whitland.—June 16.—For extension and renovation of the Tabernacle Congregational Church. Mr. I. Newton Rees, secretary, The Emporium, Whitland.

Windsor.—June 13.—For alterations and additions to the boys' and girls' schools in the Bachelor's Acre, for the managers of the Windsor Royal Free Schools. Messrs. Edgington & Spink, architects, 52 High Street, Windsor.

Worcester.—June 24.—For rebuilding in brickwork of Kenswick Bridge, on the main road between Worcester and Martley. Deposit 1*l.* 1*s.* Mr. J. H. Garrett, surveyor of county bridges, Shire Hall, Worcester.

Wrexham.—June 21.—For erection of a park superintendent's house at the Parciau. Deposit 1*l.* Mr. John England, borough engineer, Willow Road.

# TENDERS.

### APSLEY OUISE (BEDS.).

For erection of a country house and outbuildings. Mr. W. B. Stonebridge, architect and diocesan surveyor, Bedford and Woburn Sands.

| | | | |
|---|---|---|---|
| Corby & Son | £1,750 | 0 | 0 |
| Sharpe | 1,709 | 0 | 0 |
| Summerford | 1,700 | 0 | 0 |
| Sinfield & Sons | 1,697 | 0 | 0 |
| Negus, Bedford (*recommended*) | 1,546 | 0 | 0 |
| Wrycroft & Sons | 1,537 | 0 | 0 |

### BLETCHINGLEY.

For additions to Underhills, Bletchingley, Surrey. Mr. Robert P. Oglesby, architect, 15 George Street, Hanover Square, W.

| | | | |
|---|---|---|---|
| Head Bros. | £5,346 | 9 | 8 |
| Holloway Bros. | 4,320 | 0 | 0 |
| Higgs & Hill | 4,194 | 0 | 0 |
| Leslie & Co. | 4,165 | 0 | 0 |
| Longley & Co. | 4,088 | 0 | 0 |
| F. & H. F. Higgs | 4,040 | 0 | 0 |
| Strange | 3,990 | 0 | 0 |
| Allen & Co. (*accepted*) | 3,925 | 0 | 0 |

### CREWE.

For the erection and completion of the first portion of a new Ursuline Convent and School at Nantwich Road, Crewe. Mr. Henry T. Sandy, architect, Stafford and Birmingham. Quantities by the architect.

*Estimate No. 1.—Main building, &c.*

| | | | |
|---|---|---|---|
| Micklewright & Sons | £7,145 | 15 | 0 |
| Thornton & Sons | 6,905 | 0 | 0 |
| Gerrard & Sons | 6,708 | 0 | 0 |
| Cleworth & Robinson | 6,466 | 0 | 0 |
| Whittingham | 6,430 | 0 | 0 |
| Bowen & Sons | 6,378 | 0 | 0 |
| Carlyle | 6,295 | 0 | 0 |
| Tildesley | 6,176 | 0 | 0 |
| Williams & Sons | 6,127 | 0 | 0 |
| Dolan & Son | 6,100 | 0 | 0 |
| Godwin | 6,029 | 0 | 0 |
| Barnsley & Sons | 5,988 | 0 | 0 |
| Elvins & Sons | 5,970 | 0 | 0 |
| Gough & Sons | 5,850 | 0 | 0 |
| Cave & Sons | 5,800 | 0 | 0 |
| Davenport, Warrington (*accepted*) | 5,650 | 12 | 3 |

*Estimate No. 2.—Cubicle Divisions, &c.*

| | | | |
|---|---|---|---|
| Micklewright & Sons | £154 | 15 | 6 |
| Thornton & Sons | 141 | 15 | 0 |
| Gerrard & Sons | 126 | 0 | 0 |
| Tildesley | 125 | 0 | 0 |
| Whittingham | 125 | 0 | 0 |
| Cleworth & Robinson | 123 | 0 | 0 |
| Bowen & Sons | 115 | 0 | 0 |
| Barnsley & Sons | 114 | 0 | 0 |
| Cave & Sons | 114 | 0 | 0 |
| Carlyle | 110 | 0 | 0 |
| Elvins & Sons | 110 | 0 | 0 |
| Williams & Sons | 105 | 1 | 3 |
| Dolan & Son | 95 | 0 | 0 |
| Godwin | 95 | 0 | 0 |
| Gough & Sons | 95 | 0 | 0 |
| Davenport, Warrington (*accepted*) | 91 | 1 | 8 |

*Estimate No. 3.—Boundary walls, playgrounds, &c.*

| | | | |
|---|---|---|---|
| Micklewright & Sons | £688 | 10 | 0 |
| Williams & Sons | 650 | 10 | 6 |
| Gerrard & Sons | 580 | 0 | 0 |
| Cleworth & Robinson | 573 | 0 | 0 |
| Thornton & Sons | 551 | 0 | 0 |
| Bowen & Sons | 533 | 0 | 0 |
| Whittingham | 520 | 0 | 0 |
| Tildesley | 513 | 0 | 0 |
| Carlyle | 506 | 0 | 0 |
| Godwin | 506 | 0 | 0 |
| Elvins & Sons | 500 | 0 | 0 |
| Gough & Sons | 485 | 0 | 0 |
| Barnsley & Sons | 475 | 0 | 0 |
| Dolan & Son | 455 | 0 | 0 |
| Cave & Sons | 440 | 0 | 0 |
| Davenport, Warrington (*accepted*) | 392 | 10 | 5 |

### DOVERCOURT.

For erection of new headquarters, sergeant-instructor's house, stores, &c., with alterations to drill hall, for the Essex and Suffolk Royal Garrison Artillery, at Dovercourt, Harwich.

| | | | |
|---|---|---|---|
| Roper | £1,507 | 0 | 0 |
| Bennett | 1,385 | 0 | 0 |
| Gayford | 1,324 | 0 | 0 |
| Spencer, Santo & Co. | 1,310 | 0 | 0 |
| Beaumont | 1,302 | 0 | 0 |
| Newton | 1,297 | 10 | 0 |
| Fisher & Woods | 1,295 | 0 | 0 |
| Kenney | 1,243 | 0 | 0 |
| Saunders, Dovercourt (*accepted*) | 1,198 | 0 | 0 |

### ILFORD.

For the erection of centre block, "Homes of Rest," South Park, Ilford, for the trustees of the Sons of Temperance (London Grand Division) Pension and Almshouse Fund. Mr. Arthur C. Russell, M.S.A., architect, 13 Basinghall Street, E.C.

| | | | |
|---|---|---|---|
| Hosking | £1,867 | 0 | 0 |
| Ham | 1,760 | 0 | 0 |
| Shorter & Co. | 1,600 | 0 | 0 |
| Marsland & Sons | 1,519 | 0 | 0 |
| Kingerley & Sons | 1,467 | 0 | 0 |
| Hammond & Miles | 1,450 | 0 | 0 |
| F. & A. Willmott | 1,427 | 0 | 0 |
| Richards | 1,416 | 0 | 0 |
| Stockins (*accepted*) | 1,245 | 0 | 0 |
| Architect's estimate | 1,445 | 0 | 0 |
| Add for sub-contracts | 200 | 0 | 0 |

### LAINDON.

For rebuilding The Duke's Head, Laindon Common, Essex. Quantities by Mr. J. B. H. Low, Chelmsford.

| | | | |
|---|---|---|---|
| Flaxman | £1,654 | 0 | 0 |
| Burtwell | 1,630 | 0 | 0 |
| Weight | 1,600 | 0 | 0 |
| Norden | 1,512 | 0 | 0 |
| Hammond & Son | 1,500 | 0 | 0 |
| Rayner | 1,448 | 0 | 0 |
| Cowers, Chelmsford (*accepted*) | 1,375 | 0 | 0 |

### LEEDS.

For the demolition of the existing bridge and the construction and erection of a temporary timber bridge, together with other accommodation works, and the masons', bricklayers', excavators', and ironfounders' works in connection with the construction and erection of a new 50-feet wide bridge, in three spans, across the River Aire at Kirkstall, Leeds, for the Corporation.

| | | | |
|---|---|---|---|
| Baldry, Yerburgh & Hutchinson | £23,600 | 0 | 0 |
| Lawson & Son | 22,085 | 0 | 0 |
| Cleveland Bridge and Engineering Co. | 20,588 | 0 | 9 |
| Muirhead & Co. | 20,000 | 0 | 0 |
| Cochrane & Sons | 19,828 | 4 | 6 |
| Nowell & Son | 18,759 | 6 | 9 |
| Hyslop | 18,393 | 13 | 1 |
| Thorne & Sons | 18,387 | 13 | 11 |
| Holme & King | 17,263 | 12 | 8 |
| Butterley Iron Co. | 16,742 | 18 | 4 |
| Naylor Bros. | 16,367 | 4 | 3 |
| Craig | 16,238 | 0 | 0 |
| Lant | 15,851 | 2 | 2 |
| Nicholson & Son | 15,806 | 16 | 11 |
| Dougill & Son | 15,688 | 17 | 10 |
| Nowell | 15,518 | 14 | 2 |
| Bushby & Son | 15,500 | 0 | 0 |
| Butler & Co. | 15,451 | 16 | 2 |
| Yorkshire Hennebique Contracting Co. | 15,408 | 17 | 11 |
| Tate & Gordon | 15,326 | 1 | 3 |
| Parkinson | 15,232 | 0 | 0 |
| Bentley & Co. | 15,080 | 10 | 0 |
| Bentley & Son | 14,591 | 7 | 9 |
| Braithwaite & Co. | 14,042 | 9 | 8 |
| Arnold & Son | 13,976 | 0 | 0 |

### LITTLEHAMPTON.

For cleaning, painting, and repairs at Millfield, Rustington, for the Metropolitan Asylums Board.

| | | | |
|---|---|---|---|
| Olliver & Sons | £345 | 0 | 0 |
| Churcher & Sons | 335 | 10 | 0 |
| Vigor & Co. | 325 | 0 | 0 |
| Crouch | 317 | 0 | 0 |
| Drake & Co. | 280 | 0 | 0 |
| Snewin Bros. | 271 | 0 | 0 |
| Jewell | 270 | 0 | 0 |
| Linfield & Sons, Littlehampton (*accepted*) | 269 | 0 | 0 |
| Summers Bros. | 264 | 11 | 9 |

## LEYTONSTONE.

For the erection of the County High School, for 300 girls, at Leytonstone, Essex. Messrs. William & J. H. Jacques, architects, 2 Fen Court, Fenchurch Street, E.C.

| | | | |
|---|---|---|---|
| Whiter & Co. | £13,787 | 0 | 0 |
| Spencer, Santo & Co. | 13,622 | 0 | 0 |
| Lawrence & Son, Ltd. | 13,344 | 0 | 0 |
| Higgs | 13,136 | 0 | 0 |
| Shurmur & Son, Ltd. | 13,131 | 0 | 0 |
| Brand, Pettit & Co. | 12,979 | 0 | 0 |
| Woollaston & Co. | 12,751 | 0 | 0 |
| Cracknell | 12,736 | 0 | 0 |
| Perry & Co. | 12,691 | 0 | 0 |
| Carter | 12,567 | 0 | 0 |
| Coles | 12,351 | 0 | 0 |
| Horswill | 12,265 | 0 | 0 |
| F. & G. Foster | 12,186 | 0 | 0 |
| Nightingale | 12,185 | 0 | 0 |
| Cook & Sons | 12,152 | 0 | 0 |
| Allen & Sons, Ltd. | 12,030 | 0 | 0 |
| Maddison | 11,949 | 0 | 0 |
| Monk | 11,941 | 0 | 0 |
| Symes | 11,719 | 0 | 0 |
| Moss | 11,597 | 0 | 0 |
| Coxhead | 11,462 | 0 | 0 |
| Hammond & Sons | 11,325 | 0 | 0 |
| Clark & Sons, Cambridge (*accepted*) | 11,278 | 0 | 0 |

## LONDON.

For the supply of centrifugal pumps, &c., for the storm-water pumping-station which is being erected beside the Abbey Mills pumping-station, for the London County Council.

| | | | |
|---|---|---|---|
| Drysdale & Co. | £9,762 | 0 | 0 |
| Worthington Pump Co. | 9,133 | 0 | 0 |
| Tangyes, Ltd. | 8,750 | 0 | 0 |
| Cochrane, Barrhead, near Glasgow (*recommended*) | 8,400 | 0 | 0 |
| Chief engineer's estimate | 9,000 | 0 | 0 |

For the repainting of Chelsea Bridge, for the London County Council.

| | | | |
|---|---|---|---|
| Proctor & Sons | £2,589 | 1 | 0 |
| Bagnall & Sons | 1,977 | 10 | 3 |
| Markham & Markham | 1,737 | 0 | 0 |
| Woollaston & Co. | 1,680 | 17 | 2 |
| Vigor & Co. | 1,635 | 0 | 0 |
| Dudley, New Southgate (*recommended*) | 1,519 | 6 | 7 |
| Woollaston Bros. | 1,385 | 8 | 4 |
| Estimate of the chief engineer | 1,900 | 0 | 0 |

For incorporating additional land in the playgrounds of the Heckford Street school, Limehouse, and for planting shrubs and creepers round the shaft of the Rotherhithe Tunnel, for the London County Council.

| | | | |
|---|---|---|---|
| Calnan & Sons | £990 | 0 | 0 |
| Harris | 971 | 0 | 0 |
| Vigor & Co. | 929 | 0 | 0 |
| McCormick & Sons | 896 | 0 | 0 |
| Grover & Son | 883 | 0 | 0 |
| Mather | 872 | 0 | 0 |
| Roome & Co. | 860 | 0 | 0 |
| Newell & Lusty | 850 | 0 | 0 |
| Price | 827 | 0 | 0 |
| Jackson, Rectory Works, White Horse Lane (*recommended*) | 779 | 15 | 0 |
| The architect's estimate | 881 | 0 | 0 |

For the provision of a shelter at Wandsworth Park, for the London County Council.

| | | | |
|---|---|---|---|
| Bickerton | £130 | 15 | 0 |
| F. & G. Foster | 127 | 10 | 0 |
| Line | 127 | 0 | 0 |
| J. & C. Bowyer | 123 | 0 | 0 |
| Barker & Co., Kensington High Street (*recommended*) | 117 | 0 | 0 |
| Estimate | 95 | 0 | 0 |

For the erection of banking premises at Lower Edmonton, N., for the London and Provincial Bank, Ltd. Mr. V. Vagnolini, architect and surveyor, 33 Stirling Road, Clapham Rise, London, S.W.

| | | | |
|---|---|---|---|
| Irwin | £3,125 | 0 | 0 |
| Newby & Bros. | 2,985 | 0 | 0 |
| Mattock Bros. | 2,983 | 0 | 0 |
| Fairhead & Son | 2,963 | 0 | 0 |
| Knight & Son | 2,948 | 0 | 0 |
| Monk | 2,815 | 0 | 0 |
| Rice & Son (*accepted*) | 2,796 | 0 | 0 |

## LONDON—*continued.*

For painting and cleansing works at the Kensington infirmary.

| | | | |
|---|---|---|---|
| Holland & Co. | £950 | 0 | 0 |
| Clayton | 780 | 0 | 0 |
| Wright | 750 | 0 | 0 |
| Lole & Co. | 464 | 0 | 0 |
| Dainton | 463 | 0 | 0 |
| Bendon | 455 | 0 | 0 |
| Inns | 445 | 0 | 0 |
| McArthur & Co. | 418 | 10 | 0 |
| F. & T. Johnson | 392 | 2 | 0 |
| Nightingale | 379 | 0 | 0 |
| Squire | 358 | 15 | 0 |
| Woollaston & Co. | 356 | 0 | 0 |
| McCarthy | 319 | 0 | 0 |
| Woollaston Bros., South Hackney (*accepted*) | 251 | 0 | 0 |

For providing and fixing (exclusive of building work) the heating apparatus at the school in course of erection on the Manor Lane site, Lewisham, for the London County Council.

| | | | |
|---|---|---|---|
| Stevens & Sons | £1,050 | 0 | 0 |
| J. & F. May | 807 | 10 | 0 |
| Grundy | 799 | 0 | 0 |
| Brightside Foundry and Engineering Co. | 759 | 0 | 0 |
| Haden & Sons | 749 | 0 | 0 |
| G. & E. Bradley | 741 | 0 | 0 |
| Cannon & Sons | 715 | 0 | 0 |
| Cash & Co., Caxton House, Westminster (*recommended*) | 674 | 0 | 0 |
| Architect's estimate | 740 | 0 | 0 |

For cleaning, painting, and repairs at the Northern Hospital, for the Metropolitan Asylums Board.

| | | | |
|---|---|---|---|
| Pavey & Son | £645 | 0 | 0 |
| Newby & Bros. | 619 | 0 | 0 |
| Squire | 579 | 0 | 0 |
| Vigor & Co. | 480 | 0 | 0 |
| Milton | 350 | 0 | 0 |
| Nightingale, Albert Embankment, S.E. (*recommended*) | 290 | 0 | 0 |
| Woollaston & Co. | 258 | 0 | 0 |
| Engineer-in-chief's estimate | 430 | 0 | 0 |

For supplying and erecting wrought-iron boundary fencing and gates around Wormholt Park, Hammersmith. Mr. H. Mair, borough surveyor, Hammersmith.

| | | | |
|---|---|---|---|
| Bromsgrove Guild | £963 | 10 | 6 |
| Wrinch & Sons | 490 | 17 | 3 |
| Bayliss, Jones & Bayliss | 375 | 14 | 0 |
| Palmer & Co. | 373 | 9 | 5 |
| Miller & Sons | 365 | 16 | 0 |
| Hill & Smith, Ltd., Queen Victoria Street, E.C. (*accepted*) | 351 | 5 | 3 |

For erection of new villas, central bath-room, and additional staff quarters at the Epileptic Colony, for the L.C.C.

| | | | |
|---|---|---|---|
| Wall | £11,049 | 0 | 0 |
| Leslie & Co. | 10,736 | 0 | 0 |
| Foster & Dicksee | 10,706 | 0 | 0 |
| Holloway Bros. | 10,680 | 0 | 0 |
| Greenwood | 10,373 | 0 | 0 |
| Johnson & Co. | 9,990 | 0 | 0 |
| Parker & Sons | 9,760 | 0 | 0 |
| Patman & Fotheringham | 9,743 | 0 | 0 |
| Carmichael | 9,727 | 0 | 0 |
| Lawrance & Sons, City Road, E.C. (*accepted*) | 9,224 | 0 | 0 |

## MINSTER.

For sewerage works (Contract No. 1), for Sheppey Rural District Council. Mr. F. W. S. Stanton, A.M.Inst.C.E., 3 Victoria Street, S.W.

| | | | |
|---|---|---|---|
| Skinner | £8,350 | 0 | 0 |
| Deakin | 6,254 | 0 | 0 |
| Milton | 6,100 | 0 | 0 |
| Muirhead & Co. | 5,969 | 0 | 0 |
| Nunn & Co. | 5,889 | 0 | 0 |
| E. & E. Iles | 5,555 | 0 | 0 |
| Jackson | 5,500 | 0 | 0 |
| Pedrette | 5,480 | 0 | 0 |
| Gibbons | 5,412 | 0 | 0 |
| Ford | 5,369 | 0 | 0 |
| Kemp Bros. | 5,311 | 0 | 0 |
| Brebner & Co. | 5,238 | 0 | 0 |
| Bell & Sons | 5,191 | 0 | 0 |
| Burrows | 5,166 | 0 | 0 |
| Rayner, Wallington (*accepted*) | 5,006 | 0 | 0 |

## NORTHAMPTON.

For the erection of an elementary school for 208 scholars and teachers' house at Blisworth. Messrs. Brown & Mayor, architects, Northampton.

| | Price for Plastered Walls | | | Plain Bricks. | | |
|---|---|---|---|---|---|---|
| Sharp | £4,545 | 0 | 0 | £4,496 | 0 | 0 |
| Heap | 4,067 | 0 | 0 | 4,019 | 0 | 0 |
| H. Green | 3,970 | 0 | 0 | 3,935 | 0 | 0 |
| E. Green | 3,884 | 0 | 0 | 3,854 | 0 | 0 |
| Martin, Ltd. | 3,865 | 0 | 0 | 3,812 | 0 | 0 |
| Higgins | 3,755 | 0 | 0 | 3,710 | 0 | 0 |
| Sharman & Son | 3,748 | 0 | 0 | 3,699 | 0 | 0 |
| Hickman | 3,729 | 0 | 0 | 3,689 | 0 | 0 |
| Webster | 3,673 | 0 | 0 | 3,631 | 0 | 0 |
| Fisher, Northampton | 3,562 | 0 | 0 | *3,532 | 0 | 0 |

* Accepted conditionally, but certain work to be omitted, reducing the contract price to 3,360*l*.

## SOUTHBOROUGH.

For the construction of two bacteria beds with sprinklers and tanks, also for other works in connection therewith, for the Southborough Urban District Council.

| | | | |
|---|---|---|---|
| Smith & Co. | £2,484 | 18 | 5 |
| Martin & Co. | 2,314 | 0 | 0 |
| Osenton | 2,289 | 12 | 5 |
| Crates & Son | 2,271 | 4 | 4 |
| Punnett & Sons | 2,160 | 0 | 0 |
| Jarvis, Tunbridge Wells (*accepted*) | 2,060 | 0 | 0 |

## TORQUAY.

For the erection of the Town Hall.

| | | | |
|---|---|---|---|
| Bovey & Son, Torquay | £29,547 | 0 | 0 |
| Wilkins & Sons, Bristol (*accepted*) | 28,869 | 0 | 0 |

Twenty tenders were received.

## WALES.

For drainage and formation of new streets, &c., at Llantwit Vardre, for the Tynynant Land and Building Co., Ltd. Messrs. Gibson, Parry, Williams & Co., architects and surveyors, Pontypridd.

| | | | |
|---|---|---|---|
| Richards | £1,954 | 10 | 5 |
| John & West | 1,678 | 7 | 3 |
| Mackay & Davies | 1,392 | 0 | 0 |
| Webb & Sons | 1,342 | 17 | 2 |
| Jones | 1,199 | 14 | 0 |
| Morgan, Pontypridd (*accepted*) | 1,176 | 9 | 11 |

For erecting twenty-four houses at Argoed (Mon.), for Argoed Workmen's Building Club. Mr. A. F. Webb, architect and surveyor, Blackwood and Tredegar.

| | | | |
|---|---|---|---|
| Radford & Greaves | £7,320 | 0 | 0 |
| Charles | 5,322 | 0 | 0 |
| Morgan & Co. | 5,280 | 0 | 0 |
| Davies | 5,250 | 0 | 0 |
| W. & D. Thomas | 5,102 | 0 | 0 |
| Todden & Lee | 5,040 | 0 | 0 |
| Davis & Williams | 4,794 | 0 | 0 |
| Rowditch | 4,716 | 0 | 0 |
| Dordge, Argoed (*accepted*) | 4,712 | 0 | 0 |

For extensions and alterations to the Blaenavon Forge Side Council school, Blaenavon, Mon. Mr. J. Bain, architect, Newport.

| | | | |
|---|---|---|---|
| Campbell | £2,750 | 0 | 0 |
| Morgan | 2,675 | 0 | 0 |
| Jerrett | 2,600 | 0 | 0 |
| Davies & Sons | 2,500 | 0 | 0 |
| Leadbeter | 2,400 | 0 | 0 |
| Charles | 2,300 | 0 | 0 |
| Reed | 2,200 | 0 | 0 |
| Moon, Newport (*accepted*) | 2,197 | 0 | 0 |

For the construction and maintenance of a skew bridge, consisting of two spans of 41 feet 6 inches each by 50 feet wide, over the river Ely, in lieu of the existing masonry bridge, and for certain road works in connection therewith, for the County of Glamorgan and City of Cardiff.

| | | | |
|---|---|---|---|
| Everett | £8,396 | 5 | 3 |
| Thompson & Co. | 7,587 | 19 | 6 |
| Thorne & Sons | 7,404 | 10 | 1 |
| Muirhead & Co. | 6,604 | 5 | 10 |
| Rutter & Co. | 6,482 | 8 | 6 |
| British Construction Co. | 5,940 | 0 | 0 |
| Barnes, Chaplin & Co. | 5,779 | 1 | 6 |
| Strachan | 5,730 | 0 | 0 |
| Turner & Sons | 5,654 | 10 | 1 |
| Palmer | 5,634 | 12 | 11 |
| Frazer | 5,562 | 2 | 6 |
| Hyslop | 5,504 | 2 | 5 |
| Davies, Cardiff (*accepted*) | 4,896 | 7 | 4 |

## WALES—*continued.*

For rebuilding No. 148 High Street, Merthyr Tydfil. Mr. C. M. Davies, architect, 112 High Street, Merthyr Tydfil.

| | | | |
|---|---|---|---|
| Jenkins | £1,167 | 18 | 4 |
| Jenkins Bros. | 1,150 | 0 | 0 |
| James | 1,132 | 0 | 0 |
| Moss | 1,035 | 0 | 0 |
| Spratt, Rhondda Valley (*accepted*) | 1,010 | 0 | 0 |
| Warlow & Warlow | 950 | 0 | 0 |

## JEWELLERS' ART SCHOOL, BIRMINGHAM.

The Museum and School of Art Committee of the Birmingham City Council, in their report at the meeting of the City Council on June 7, stated that they found it necessary to ask for powers to enable them to provide at once for the extension of the Vittoria Street School for Jewellers and Silversmiths. When this school was founded at the Ellen Street Council school with the co-operation of the Birmingham Jewellers' and Silversmiths' Association in 1888 it was looked upon as an experiment. In 1890 the Council sanctioned the acquisition and adaptation of some jewellery works in Vittoria Street for the housing of the school. The school has since developed in such a remarkable degree that it now holds a high position amongst the schools of art in the kingdom, and it has long been necessary that it should be provided with a more suitable and properly equipped building. In a previous report the committee stated that extensive structural alterations had been carried out to the school building on the advice of the city surveyor in order to provide adequate means of escape in case of fire. These alterations curtailed the accommodation in rooms which were already overcrowded, and rendered the new life room practically useless. Every department of the school is overcrowded, and further accommodation is urgently needed for additional classes in important branches of the metal work trade, such as die-sinking, engraving, tool-making, repoussé, flat hammering, &c. It is also necessary to provide accommodation for advanced classes in the subjects already taught. Students can only be taken up to a certain point in their studies owing to lack of space, and consequently it is impossible to give as thorough a training as is necessary in certain subjects. The committee endeavoured to obtain possession of land in the immediate vicinity of the school, and negotiations were entered into with the leaseholders of the surrounding property, but it has not been possible to obtain possession of any leases excepting upon exorbitant terms. The only good result of these endeavours was an undertaking entered into by the Governors of the King Edward's School Foundation, who own the land upon which the school stands, and also all the land immediately surrounding it, that when the leases of this property fall in in 1920 the Museum and School of Art Committee shall be granted the option of taking on lease such land as they need for the extension of the school premises. The committee were thus placed in the position of either obtaining an extension of their school at an unreasonable expense, or of finding an alternative site. They were unanimously of opinion that the present situation in the centre of the jewellers' quarter is an admirable one and should not be abandoned; moreover removal would be very costly. It was decided to attempt to carry on the work of the school in the present building until 1920, in spite of the great inconvenience and consequent detriment to its development. But the need for extension has lately become so pressing and urgent that the committee were unable to delay the matter any longer. Moreover, the Board of Education requested that serious consideration should be given to the inadequacy of the school premises and they have asked that steps shall be taken, without delay, to provide the additional accommodation which they consider is so urgently required. At the same time that the committee received this communication from the Board of Education it came to the knowledge of Messrs. Grimley & Son, the agents recently employed by the committee in their negotiations, that it would be possible to obtain the leasehold interest in a plot of land of 1,175 square yards, situated on the south side of the school, with a frontage to both Vittoria Street and Frederick Street, for the sum of not more than 1,000*l*. The committee recommended the Council to sanction the purchase of this lease, which will enable them to build on 400 square yards of the land, having a frontage of 56 feet to Vittoria Street, and to so extend the school as to provide adequate accommodation for the urgent needs of the present, and at the same time enable the existing building to be used to much greater advantage. The other part of the land is held under a sublease for the remainder of the term and is not available for extension. The lease expires in 1920, at the same time as the one upon which the site of the present school building is held; and, in order to both justify the committee in erecting a building on this land and also to provide for the future development of the school, the committee asked for permission to approach the Governors of the King Edward's School Foundation requesting them to at once enter into an agreement to grant a fresh lease to the Corporation of the whole site from 1920. This would render unnecessary any future removal of the school. If satisfactory terms are arranged with the Governors (and there is reason to believe that the Corporation will receive every consideration at their hands) the committee will at once draw up a scheme for the extension of the school, together with an estimate of the cost, for presentation to the Council. The committee remind the Council of the fact that this school is conducted at comparatively little expense to the ratepayers of Birmingham. The gross annual expenditure during the last few years has amounted to about 2,025*l.* Towards this expenditure the Board of Education has contributed 850*l.*, the Birmingham Jewellers' and Silversmiths' Association 530*l.* (annual contribution 450*l.*, prize fund 25*l.*, and fees of students 55*l.*), the members of the Jewellers' and Silversmiths' Association 55*l.* in fees, and the City Council 545*l.*

At a meeting of the City Council on Tuesday the report was adopted.

## REINFORCED CONCRETE BINS.*

AMONG the varied uses to which reinforced concrete is now put the construction of bins for the storage of materials of various kinds, the author considered, took an important place. Reinforced bins had been constructed for holding grain, coal, cement, ore, broken stone, sand and other materials. It seemed established now that not only did reinforced concrete possess in a supreme degree the qualities of fire-resistance and long life, in which respects it was superior to steel, that had been used largely for the construction of silos in preference to timber, but it originally cost no more, and sometimes less than steel, while the cost of frequent painting and repairs was saved. Steel bins cost 50 to 100 per cent. more than timber bins of moderate size.

Reinforced concrete bins were classified by the author into two main divisions:—(1) Those of large size without separate divisions, and having relatively large area in respect to height; and (2) those of cellular construction, having compartments of rectangular, square, round, or hexagonal cross-section. The silos in both divisions were usually charged with materials from the top either by direct dumping from railway waggons or carts or by means of conveyors.

The first division chiefly became the problem of the retaining wall so far as design was concerned. The paper described some reinforced concrete bins of this type. Such bins are usually required to discharge material by gravitation, and they were most often built with bottoms sloping one way to two sides, or to all sides, and delivering the material through side gates.

The second division entailed rather different mathematical analysis in the design, and the paper was chiefly concerned with the description of reinforced concrete bins of such cellular type, which likewise discharged their contents by gravitation, but generally, because of their shaft-like arrangement, were made to discharge the material directly under them from their lowest point through a centric or eccentric hole, and occasionally through side openings. These cellular silos might be again subdivided into (1) suspension bunkers; (2) circular bins; and (3) hopper bins. The first were constructed by suspending from two side girders the bottom, which was curved to assume the form of the equilibrium polygon, the stresses in the containing surface of a truly formed suspension bunker thus being purely tensile ones. In this connection it might be remarked that some suspension bunkers had been built of steel plates with a reinforced concrete lining. The circular bins (the second subdivision) were constructed with spherical or conical bottoms and the stresses were circumferential tension and vertical compression in the cylindrical sides, and tangential and circumferential tension in the bottoms. The third subdivision included the square, rectangular, and hexagonal bins, in which there were bending stresses introduced as well as direct tensile and compression stresses. The square hopper bins were perhaps the more usual type of reinforced concrete bin in this country.

The calculation of the pressures upon the side walls and bottoms of bins, the author stated, had been the subject of a fair amount of experiment and theorization, but in those of large size the lateral pressure was determined by the ordinary retaining wall theories, about which there has been a great deal of theorising and very little experimentation. The theorists, however, worked upon two main lines of thought, namely, that of Coulomb's theory of the prism of maximum pressure and Rankine's theory of conjugate stresses. Though the variants on these two theories were very numerous, there were really only two mathematical processes of treating the same fundamental idea. They were only special cases of a single general equation.

The paper then gave formulæ for retaining walls, shallow and deep bins, circular bins, suspension bunkers, and special applications of reinforced concrete, together with tables containing experimental data and diagrams to save labour in designing bins.

Some tests have shown great increase of pressure when material was in motion in bins, but only in the cases where discharge openings were at the sides, which established the importance of such openings being in the centre, for the pressures in motion with side openings were in some cases four times as great as when at rest. When, however, the grain was discharged at the centre, the maximum variation did not exceed 10 per cent.

Reinforced concrete, apart from its fire-resisting qualities and long life, possessed some distinctive advantages as regards resistance to stresses in bins. It so happened that the horizontal reinforcement in the walls of cellular silos when resisting the bending induced by one cell being loaded while the adjoining one was empty, was not called upon to develop more than half the anchorage resistance that would require to be developed with all pockets filled simultaneously. Likewise when the anchorage stresses were greatest the bending was nil, because adjoining pockets were filled. Therefore the reinforcement for the walls afforded at the same time the best anchorage for them, and it served both functions in turn.

The corners of cellular bins in the interior of a collection were usually considered to be completely fixed, and therefore the moment at the centre was taken as $pl\,\frac{2}{24}$ and in the corners as $pl\,\frac{2}{12}$, where $p$=the unit pressure. In order to obtain the greater resistance moment thus required at the corners recourse was usually had to the expedient of doubling the thickness of the walls there so as to use the same amount of horizontal reinforcement. The splaying of these corners serves other advantageous purposes in theory and practice.

It was not easy to get exact figures of the cost of erection of various bins and silos, especially in this country. In America the reinforced concrete storage bins at the Santa Fe Elevator, Chicago, Ill., cost 20 cents per bushel of storage capacity, whereas the timber working house at the same place cost $1 per bushel of storage capacity, exclusive of power plant; the machinery was, however, unusually expensive, and this made the cost high.

The working house of the Santa Fe reinforced concrete elevator at Argentine, Kas., cost 60 cents per bushel of storage capacity, exclusive of power plant, while the bins there cost 20 cents per bushel.

Regarding this country a silo containing 449,000 cubic feet of grain, with bins 8 feet square, worked out at 8*d.* per cubic foot of grain capacity, or 6*d.* per cubic foot of total cubical extent. Bunkers standing on legs containing 10,280 cubic feet worked out at 1*s.* 5*d.* per cubic foot of coal capacity, and 7*d.* per cubic foot on total cubical extent, while others somewhat larger cost $11\frac{1}{4}d.$ per cubic foot of coal capacity, or $5\frac{3}{4}d.$ per cubic foot on total cubical extent. Some maize silos in London for 167,400 cubic feet of material cost 1*s.* per cubic foot of grain capacity, or 6*d.* per cubic foot total cubical extent. Some silos in Dublin containing 33,000 cubic feet of grain cost $7\frac{3}{4}d.$ per cubic foot of grain capacity.

THE new drainage scheme for Newquay will cost 12,300*l.*

THE new station on the London, Tilbury and Southend Railway is to be opened next month. The Southend Chamber of Commerce has passed a resolution thanking the General Manager of the L.T. & S.Ry. for the excellent service of trains provided to London and Southend.

THE buildings sub-committee of Nottingham recommend that, as they consider increased efficiency and economy result from single-storey schools, the consent of the Board of Education should be obtained for purchasing an additional strip of land at the Cameron Street corner of the Haydn Road site, having an area of about 3,050 square yards, at 4*s.* 9*d.* per yard, in order to allow the erection of three single-storey schools upon the site.

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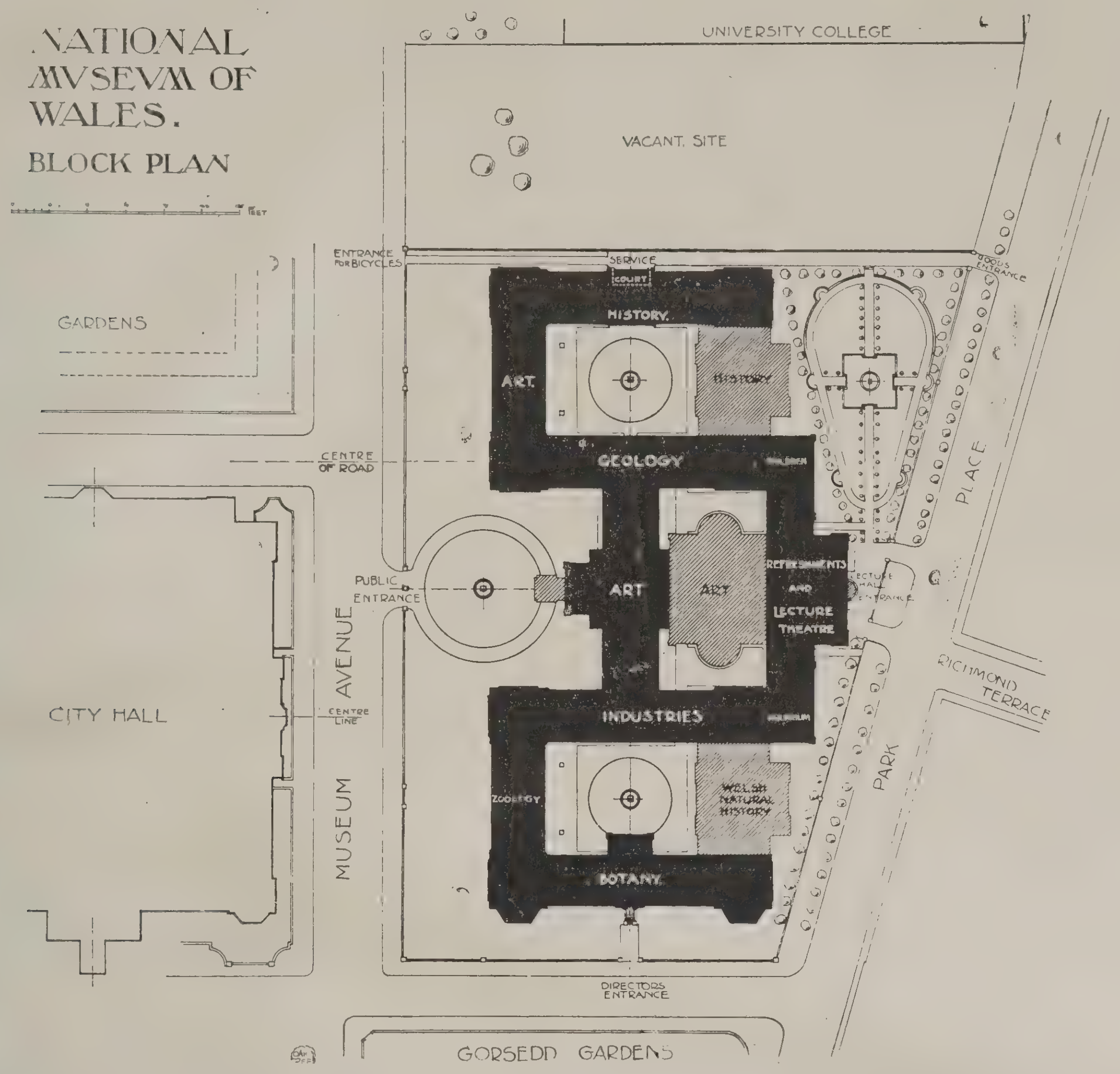
* A paper read on May 26 at the tenth ordinary general meeting of the Concrete Institute at the Royal United Service Institution, Whitehall, by Mr. H. Kempton Dyson, Secretary, Concrete Institute.



## CLAIM AGAINST AN ARCHITECT.

The case of Raikes *v.* Power, before Mr. Justice Darling and a special jury in the King's Bench Division on Tuesday, the 7th inst., was actually heard upon defendant's counterclaim against plaintiff and Mr. Charles O. King, architect.

The plaintiff on the counterclaim, Mr. William Mailes Power, picture dealer, sought to obtain damages against Mr. R. T. Raikes, managing owner of the estate in which plaintiff's shop at 123 Victoria Street, S.W., is situated, and Mr. King, architect for the estate, because of what he alleged to be their negligence in the building of a picture gallery for him, as the result of which a large number of valuable paintings were injured by damp and mildew.

Mr. Clavell Salter, K.C., counsel for plaintiff, said his client rented the shop from Mr. Raikes in January, 1908, at a rental of 500*l.* a year. There was a covenant in the agreement providing that Mr. Power should have liberty to build a picture gallery in the yard at the back of his shop. Another agreement was entered into by which it was arranged that Mr. King should draw up plans and specifications for the erection of the gallery, and that the work should be carried out by the estate workmen under his supervision. About the end of March, 1909, the building was completed, and, as Mr. King had assured Mr. Power that the gallery would be ready for immediate use, pictures were hung on the screen in April. Some weeks afterwards Mr. Power found that the pictures were being injured by damp and mildew, and on examination he discovered that although Mr. King, following the usual practice in building picture galleries, had separated the hanging screen from the wall by battens, he had neglected to provide for the ventilation of the space between them. The enclosed air was therefore stagnant, and gradually collected moisture, which penetrated the matchboarding of the screen and attacked the pictures hung upon it. Mr. Power now claimed 58*l.* odd expended by him in restoring the damaged pictures, and 240 guineas for 24 weeks' loss of the letting value of the gallery.

Defendant denied negligence and said the damage caused to the pictures arose from plaintiff's hanging pictures on the screen before the walls were dry. Mr. King, by his counsel, Mr. Foote, K.C., admitted that he had neglected to provide apertures for the ventilation of the space between the screen and the wall, but said his architect's fee of 25 guineas, which he was willing to forego, was sufficient to cover any damage caused by lack of ventilation. Mr. Raikes denied any liability or any part in the erection of the building beyond allowing his workmen to build it for Mr. Power at cost.

Among the pictures alleged to have been damaged were a Hogarth, a Gainsborough, a Lawrence, a Rembrandt, a Turner, a Michel, a Romney, and one by Sir Joshua Reynolds.

Evidence was called on behalf of Mr. Power to the effect that his claim was reasonable in amount and that the damage was caused by the lack of ventilation behind the screen.

The evidence called on behalf of Mr. King went to show that the damage to the pictures and loss of letting rent for the gallery were much over-estimated. Mr. Marchand, of the Goupil Gallery, and Mr. Philip Robson, A.R.I.B.A., also expressed the strong opinion that Mr. Power did not take proper precautions to dry the walls of the gallery by means of artificial heat, as he ought to have done. Mr. Robson said he could have dried the gallery in a fortnight by the use of braziers of coke stood upon tin.

The jury found that Mr. King had been guilty of negligence and awarded Mr. Power 45*l.* damages against that gentleman. They found also that Mr. Raikes had not been guilty of negligence.

One hundred guineas having been paid into Court by the defendants on the counterclaim His Lordship gave judgment in favour of both Mr. King and Mr. Raikes and ordered the balance of the money in Court to be paid out to them.

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Mr. A. Ernest Prescott, borough engineer and surveyor of Eastbourne, has been nominated as president of the Institution of Municipal Engineers for the year 1910-11.

## ACETYLENE LIGHTING.

THE lighting of small villages, country houses, cottages, and so on, by means of acetylene has long been accepted as giving the utmost satisfaction. Since its value was first established many improvements have been effected which still further increased its advantages. One such is controlled by Messrs. C. C. Wakefield & Co., 27 Cannon Street, E.C., and is known as the "Carbic Light." Carbic consists of carbide specially prepared and compressed into cylindrical shapes by a patent process so that every particle is impervious to atmospheric moisture, being susceptible only to moisture in liquid form. The Carbic cakes are placed in a very simple generator, and the action is dependent solely upon the balance of pressure between the water and the gas, so that the installation is easily looked after. Before distribution the gas is thoroughly washed and chemically purified, either in the generator or, in the case of larger installations, in a separate purifier. In a third size, suitable for 10 lights and upwards, the apparatus consists of either one or two simple generators connected with an automatic pressure-regulating gas bell; this ensures a uniform pressure at the burners, and is necessary in cases where a number of lights are liable to be turned on or off simultaneously. The smallest and cheapest is size 1220, which consists of the generator, but without a washer, being fitted with cotton wool purifier only. A charge of two No. 5 cakes of Carbic at 3*d.* each maintains one light of 20-candle power for 10 hours, or two lights for five hours. The price of this is only 1*l.* 15*s.*, being half the cost of the same generator fitted with a washer. No. 2 generator may also be had in two sizes. Size 2410 maintains 10 lights of 20 c.p. each for eight hours on a charge of four sixpenny cakes of Carbic. The price of this is 8*l.* 5*s.* The largest size is No. 32,510; this will maintain 40 lights of 20 c.p. each for five hours, and costs 17*l.* 10*s.* The gas in the cheapest as well as in the most expensive is generated without any smell, and gives a rich pure white light free from haze and odour. The piping and fittings are similar to those used for ordinary gas, and incandescent mantles may be employed as well as the special burners. The plant is of surprising compactness in each of the sizes, and it appears to be as reliable as it is simple in its working.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the Business General Meeting of Monday, 6th inst., the Officers, Council, and Standing Committees for the ensuing Session were declared duly elected, in accordance with the Scrutineers' Report, as follows:—

### THE COUNCIL.

*President.*—Leonard Stokes.

*Past-Presidents.*—Thomas Edward Collcutt; Ernest George.

*Vice-Presidents.*—Reginald Blomfield; Alfred William Stephens Cross; Edward Guy Dawber; Ernest Newton.

*Hon. Secretary.*—Henry Thomas Hare.

*Representatives of Allied Societies.*—Henry Clement Charlewood (Northern Architectural Association); John Bennie Wilson (Glasgow Institute of Architects); Percy Scott Worthington (Manchester Society of Architects); William Morton Cowdell (Leicester and Leicestershire Society of Architects); Arthur Stansfeld Dixon (Birmingham Architectural Association); Robert Evans, jun. (Nottingham Architectural Society); Sydney Decimus Kitson (Leeds and Yorkshire Architectural Society); Arnold Thornely (Liverpool Architectural Society); John Watson (Edinburgh Architectural Association).

*Members of Council.*—Maurice Bingham Adams; John James Burnet; Walter Cave; Max Clarke; William Flockhart; William Adam Forsyth; James Sivewright Gibson; John Alfred Gotch; Edwin Thomas Hall; George Hubbard; Henry Vaughan Lanchester; Edwin Landseer Lutyens; A. Beresford Pite; Andrew Noble Prentice; Halsey Ralph Ricardo; Henry Heathcote Statham; Sir Alfred Brumwell Thomas; Paul Waterhouse.

*Associate Members of Council.*—Sidney Kyffin Greenslade; Charles Edward Hutchinson; Charles Herbert Reilly; Harry Inigo Triggs; Herbert Winkler Wills; Arthur Needham Wilson.

*Representative of the Architectural Association.*—Arthur Keen [*F.*].

*Auditors.*—John Hudson [*F.*]; William Henry Burt [*A.*].

### THE STANDING COMMITTEES.

*Art.—Fellows*: Walter Cave; Edward Guy Dawber; William Flockhart; Henry Thomas Hare; Gerald Callcott Horsley; William Richard Lethaby; Robert Stodart Lorimer; Edwin Landseer Lutyens; Edwin Alfred Rickards; John William Simpson.—*Associates*: William Henry Bidlake; Thomas Davison; Thomas Geoffry Lucas; Walter John Tapper; Septimus Warwick; Edgar Wood.

*Literature.—Fellows*: Frank Thomas Baggallay; John Alfred Gotch; Sir Charles Archibald Nicholson, Bart.; George Halford Fellowes Prynne; Halsey Ralph Ricardo; Frederick Moore Simpson; Richard Phené Spiers; Henry Heathcote Statham; Charles Harrison Townsend; Paul Waterhouse.—*Associates*: Frank Lishman; Herbert Passmore; Charles Edward Sayer; Cyril Wontner Smith; Arthur James Stratton; William Henry Ward.

*Practice.* — *Fellows*: William Henry Atkin-Berry; Howard Chatfeild Clarke; Max Clarke; Alfred William Stephens Cross; George Hubbard; Joseph Douglass Mathews; Alfred Saxon Snell; Henry Tanner, jun.; Thomas Henry Watson; William Woodward.—*Associates*: Kensington Gammell; Edward Greenop; Edwin Richard Hewitt; Herbert Hardwicke Langston; Harry John Pearson; Augustus William Tanner.

*Science.—Fellows*: Harry Percy Adams; Bernard Dicksee; William Dunn; Frederic Richard Farrow; Matt. Garbutt; Francis Hooper; George Hornblower; John Murray; Charles Stanley Peach; Herbert Duncan Searles-Wood.—*Associates*: Henry William Burrows; Charles John Marshall; Alan Edward Munby; Digby Lewis Solomon; Ernest William Malpas Wonnacott; Ernest Alexander Young.

The following members were elected:—*As Fellows*: Ernest Robert Barrow; Arthur William Cooksey; William Bruce Dawson, and Horace Gilbert.—*As Associates*: George Luard Alexander; Walter John Beall; Noel Waugh Hadwen; Joseph Fearis Munnings; David John Roberts; Hartley Sutcliffe; Edward Alexander Taylor, and Morris Thompson.

## ARCHITECTURE NEW SOUTH WALES.

THE annual report of the Department of Public Works for New South Wales for the year ending June 30, 1909, makes interesting reading, and more especially that part of it submitted by Mr. W. L. Vernon, the chief of the Architect's Branch.

As in the two previous years, the Branch has been kept actively engaged in endeavouring to keep pace with the large amount of building operations, both in hand, to be entered into during the current year, and projected for the future, together with many professional services which are not represented by either the preparation of designs or the expenditure of moneys.

The statement of the Departmental Accountant shows that payments amounting to over 460,070*l.* passed through his hands in connection with building operations, and upwards of 1,588 Government building contracts were entered into during the year.

The permanent staff numbers eighty-two officers, many of whose claims for consideration have been favourably dealt with during the year by the Public Service Board. There is, however, according to the report, a serious want of encouragement to good officers in the absence of any automatic improvement to their positions and salaries.

The Branch has at present in its employ upwards of ninety-six temporary officers, rendered necessary by the strict curtailment in numbers of the permanent staff and the requirements of so active a period of building operations.

*General Review.*—The preparation of the annual report was thought to be a fitting occasion on which to review and generally compare its accomplished works with those of similar departments under English-speaking Governments elsewhere.

In the following notes Mr. Vernon does this briefly as far as relates to the Architect's Branch of the Public Works Department of New South Wales.

The Government has always given its professional advisers a free hand in attaining a fairly high character in its architectural work, and it has never stinted the means for providing institutions of a technical and special character necessary for a modern community. Generally speaking, it may be claimed as the result that New South Wales ranks amongst the most advanced in this respect. It certainly maintains its lead amongst the States and Dominion in Australasia.

It is therefore all the more important to carefully place the results of its operations under a close scrutiny and review in order to find out wherever it is possible to make still further advances and avoid any retrograde steps. Every day the more cultivated perception on the part of the general public of the true principles of Art as applied to architecture renders this most desirable, while the technical and scientific requirements of the Service demand a watchful contemporary knowledge of all that is progressing elsewhere in such matters.

The essentials necessary in the work of the branch are therefore:—

1. Architectural "quality" in its designs.
2. Adaptability of its buildings to their special uses.
3. The taking of full advantage of the use of improved materials and methods of construction.
4. Application of business methods in building operations and expenditure.

1. *Architectural "Quality" in Design.*—The year just closed has seen the completion up to definite stages of two notable buildings, specially designed with a view to the advancement of the art education of the people, as well as for housing their artistic and literary treasures. I refer to the National Art Gallery and the Fisher Library.

The western façade of the National Art Gallery is now, in the simplicity of its Grecian Ionic character, complete, and may be regarded as the only building of its class south of the line in which the purity of the style has been so rigidly adhered to.

Its educative value in establishing the standard with which to compare the general and sometimes miscellaneous productions of Classic architecture throughout the community is already established, and, as such, it is hoped, will always have a modifying influence.

At present the full effect of this design is not obtained, owing to the adjacent ground contour rising some four or five feet above the general level of its base, the improvement of which is awaited with considerable interest.

The frontage of this façade embraces two longitudinally-placed galleries, the external walls of which are devoid of fenestration, and purposely of quiet tone in their architectural detail, though enriched with a series of bronze panels designed in high relief by sculptors of established reputation, with a central columned portico dominating the design, and giving by a broad flight of steps public access to the galleries. The design is balanced by two flanking pavilions, each also with circular-fronted and deeply-recessed exemplifications of the Ionic.

All four façades of this building—the western and southern complete, the eastern partially so—will in course of time complete an example of this, "par excellence," most beautiful of the Classic orders.

Internally the gallery possesses for its display of sculpture a spacious vestibule, circular ended with twin domes and enriched entablatures wholly constructed in stone, with Kempsey marble column shafts and ceramic mosaic pavement.

The picture galleries themselves are in their architectural treatment in unison with that of the building as a whole.

(*To be continued.*)

## HOME ARTS AND INDUSTRIES EXHIBITION.

THE twenty-sixth annual exhibition of the Home Arts and Industries Association was opened in the Royal Albert Hall on Wednesday last, and it will close after to-morrow the 11th inst. The Association is a society for teaching the working classes such handicrafts as woodcarving, repoussé, inlaying, leather work, basket-making, and encouraging lace-work, embroidery, pottery, &c. The present exhibition is the product of 200 different centres in the United Kingdom. In most cases the object of the classes is to afford occupation to villagers in the evenings, or at periods of the year when their ordinary occupation is suspended, and at the same time to help and encourage them with the extra earnings accruing from the sale of their work. In some instances the stalls are described as Developed Industries, which means that the industries are self-supporting, with all time workers and paid management, and having an agency or depot. An instance is the Ruskin Pottery, Birmingham, which commenced as an amateur class and now employs sixteen people. It may here be mentioned that there is an exhibit of the pottery at the Venice Fine Art Exhibition; all of it has been sold, the greater number of pieces going to Italian museums. Another notable instance of a developed industry is the Potter's Art Guild at Compton, which is under the direction of Mrs. G. F. Watts, and permanently employs sixteen men and boys. The stall of sculpture work at the present exhibition should not be missed by visitors. But the greater number of the classes are fully entitled to be described as Home Arts and Industries. The quality attained is generally of a very high character, and reflects the greatest credit on the amateur and professional teachers who sacrifice many hours of leisure in a patient effort to instil into villagers a desire to spend their free hours well and profitably. It may be that their efforts are rendered easier by the fact that these industries must be part of the sub-conscious instincts of their pupils whose fathers and mothers, or grandfathers and grandmothers practised them before all handwork was crushed under the juggernaut of machinery.

## VARIETIES.

NEW artillery barracks costing 16,000*l.* are to be erected at Dover Castle.

WE have received an inquiry for Tuttle & Bailey's Ventilators. Can any reader supply us with maker's name and address?

THE Lochmaben School Board, N.B., have adopted plans for the enlargement of the school at a cost of 1,350*l.* The plans were prepared by Mr. J. B. Gladstone, architect, Lockerbie.

THE Bridlington Town Council are negotiating for the purchase of the People's Palace for the purposes of a town hall. The property has been offered to the Council for 4,500*l.* The estate has recently changed hands.

H.M. TRADE COMMMISSIONER for South Africa reports that authorisation has been given for the construction on the Central South African Railways of new stations and yards (1) at Braamfontein, at an estimated cost of 96,388*l.*, and (2) at Germiston, at an estimated cost of 70,000*l.*

THE South-Eastern and Chatham Railway are carrying out extensive alterations at Rochester at a total expenditure of 90,000*l.* A new station is to be built and additional platforms constructed. The South-Eastern and Chatham and Dover sections of the line will be linked up and new bridges erected.

THE Doncaster Rural District Council have instructed Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, to prepare a scheme of main sewerage and sewage disposal for Edlington and Warmsworth, which are rapidly increasing owing to the construction of new collieries in the district.

MR. ALFRED E. WHEELER, having terminated his engagement with Messrs. Z. D. Berry & Sons, Westminster, is now in business as a heating, ventilating, and electrical engineer at 12 Theobald's Road, W.C. In the new venture he has the co-operation of Mr. C. J. H. Ridley, who had been associated with the same firm for a period of twenty-five years. The firm is therefore Messrs. Wheeler, Ridley & Co.

BLACKPOOL Town Council have decided to extend the marine parades northwards in front of the cliffs 260 yards and widen the parades near the north pier at a total cost of 60,000*l.* The cliffs scheme will consist of a lower walk 25 feet wide and a high promenade 100 feet wide. The latter will form a departure from the rest of the sea defence works by having a greensward surface. This could be done without increasing the rate, which remains at 5*s.* 4*d.*

THE Sheffield Corporation Electric Supply Department has resolved to reduce the price of current by one-half to publicans. The present rate is 4*d.* per unit, and in future the licence-holders will be charged only 2*d.* per unit. The reason for this is that the pressure upon the department ceases about eight o'clock at night, but the department has to use the same machinery to produce the current which is then required for the remainder of the night, and wishes to gain more subscribers among those who use the supply in the later hours.

THE management of the Crystal Palace arranged with Mr. C. Grahame White to give a series of exhibition flights in the Palace grounds on Tuesday afternoon last, the 7th inst., which proved very successful. These were carried out under the auspices of the Aerial League of the British Empire on the actual aeroplane upon which the aviator made his gallant attempt from London to Manchester. In preparing the ground for the flights the League sought the advice not only of Mr. Grahame White himself but also of several of the leading aeronautical experts, and extensive preparations were made to render it suitable for the purposes of aviation. The event proved to be of a most interesting character, and we understand that the management will endeavour to arrange that these flights shall be made weekly during the summer months.

## THE NEW MESSINA.

THE sudden catastrophe of December 28, 1908, which in a few moments annihilated the city of Messina and exacted a death toll of upwards of 50,000 lives, rendering the survivors houseless, produced as a natural sequence an abrupt cessation of all commerce, but the boundless and universal benevolence extended to the sufferers, in conjunction with the recuperative power of the Latin race, has, in a comparatively short space of time, brought about an appreciable resumption of business activity. Fortunately the port did not suffer from the effects of either the eathquake or of the tidal wave which followed, with the exception of a certain amount of damage to the quays. The railway connections also remained relatively intact, consequently there is no material reason, says the British Vice-Consul in his annual report, why Messina should not regain, to a large extent, its former commercial importance.

During the first few months of 1909 relief stores, timber, and materials for the construction of temporary buildings were poured into the district, creating such a demand for manual labour that the wages of the working classes rose considerably.

Extensive villages of wooden, corrugated iron and steel-cored concrete dwellings, shops, churches, and schools soon sprang up in the district immediately adjacent to the ruined city. A certain activity of movement in the recovery from the débris of damaged iron work, lead, and like materials for shipment to other districts soon manifested itself, and as the year wore on the export of Messina produce proper, viz., lemons, peel in brine, wine, oil, walnuts, nuts, &c., was resumed.

The work of clearing away the ruins of the city goes on steadily, and the official plan for the new city is on the point of being promulgated.

Among the present population great confidence exists that the restoration of Messina and its recovery of its former prosperity may be looked for in a by no means distant future; that this confidence is not so Utopian as at first sight it might appear is shown by a comparison of the exports for 1909 with those of 1907, since with a population reduced by some 100,000, and in spite of material obstacles, a really important export trade has been done.

The new city as it at present exists, consisting of buildings as described above, is exceptionally well lighted by electricity, the new streets are well laid out, effectively macadamised, surface drained and efficiently policed, to which may be attributed the fact that the general health of Messina since the earthquake has actually been above the normal standard of previous years.

The work of repairing the quays has commenced, and when completed is expected to give greater facilities for loading and discharging merchandise than hitherto.

*New Industries.*—Two factories have been started for the manufacture of liquorice juice, one in Messina itself and one at Policara. An important factory for the manufacture of citric, tartaric and sulphuric acids and chemical products on an extensive scale is to be erected as soon as a suitable site has been allotted by the authorities. It is expected that it will give employment to quite a large number of hands. The population of Messina, according to the municipal returns up to December 31, 1907 (those for 1908 were destroyed), including the suburbs, was 167,824. The present population is now estimated by the municipal authorities to be between 50,000 and 60,000 (no actual census has been taken since the earthquake).

## THE CITY AND GUILDS OF LONDON INSTITUTE AND SCULPTURE.

THE report of the Council presented at the annual meeting of the members of the City and Guilds of London Institute contains in more than one place reference to the success gained by past and present sculpture students.

In the report congratulations are given to Mr. W. Goscombe John on his election to the full membership of the Royal Academy. Mr. Goscombe John was one of the first four students of the Institute who gained the Gold Medal and Travelling Studentship of 200*l.* of the Royal Academy between the years 1883 and 1889. All of them have since been elected Associates of the Royal Academy — Harry Bates, A.R.A., is deceased; Mr. F. W. Pomeroy, A.R.A., Sir George Frampton, R.A., and Mr. Goscombe John, R.A. It will be noticed that Mr. John is the second to obtain full membership. Of the four sculptors who have attained the rank of Royal Academician two are past students of the Institute, and of five who have attained the rank of Associates two (Mr. Pomeroy and Mr. W. R. Colton) are also past students of the Institute.

That the spirit which actuated the oldest students is shared by the younger receives a remarkable testimony in the Royal Academy competitions of December last, when of the seven prizes offered by the Academy, six were awarded to students of the Institute.

At the last competition of the Royal Academy for the gold medal and travelling studentship of 200*l.* in sculpture the award was made to Alfred Buxton, who has attended the department during the past nine years, under Mr. Gilbert Bayes. Mr. Bayes was himself a former student of the department who also gained the same award from the Royal Academy. The Council understand that Mr. Buxton also attended for about the same period the Westminster School of Art under Mr. E. G. Bramwell, a former student of the Institute's Kennington school, who gained the City and Guilds sculpture studentship and also a City and Guilds travelling studentship. Since the establishment of the Institute's two art schools, students of the modelling sections of these two departments have gained this medal and travelling studentship of the Royal Academy for sculpture at nine out of fourteen competitions—twice from Finsbury and seven times from the South London school.

The efficiency of the work of the modelling section of the South London School of Technical Art is, says the report, indicated ultimately in the results of the competition for the sculpture studentship. This studentship is only open to students of three years' standing. A subject for a modelled design is announced every year, and six months allowed for its execution. As far as possible the subject chosen is one calculated to give the students an opportunity of exhibiting their capacity to conceive and execute a piece of architectural sculpture embodying the results of their studies in construction, composition, and decoration founded upon their work in the studios from the antique and the life. The subject announced was "A Mural Monument to a Naval Hero." Seven models, some in clay, others cast in plaster, were submitted. These were judged by Mr. W. Robert Colton, A.R.A., a former student of the school, who reported on them as follows:—"I may say at once that the ability of the students greatly pleased me, and that I strongly recommend that a smaller prize should be given to the student who obtained the second place. The first two examples were so nearly equal in merit that not only in justice, but also for the encouragement of so good a student, I feel that the Institute should, if at all possible, make a second grant." On this report the committee awarded the studentship to S. R. Cameron, and as an exceptional award made a grant to E. S. Frith, who was placed second in the competition, to enable him to spend a few weeks examining some of the masterpieces of sculpture abroad. The school is distinctly a professional school—that is to say, the students are not amateurs, but men who are earning their living in some art work. This is shown by an analysis of their occupations as follows:—

*Modelling Section.*—Sculptors, carvers (wood and stone), and modellers, 23; moulder, art metal worker, terra cotta modeller, picture-frame designer, taxidermist, stockbroker; total, 29.

THE Education Committee of the London County Council have arranged the following art lectures for teachers, 1910-11:—"Man and his Architecture," by Mr. H. Ricardo, F.R.I.B.A. (ten lectures), estimated cost 52*l.* 10*s.*; "Greek Art, with special relation to the collections in the British Museum," by Professor E. A. Gardner, University College (ten lectures), estimated cost 60*l.*; "Pictures in the National Gallery," by Mr. A. J. Finberg (ten lectures and ten demonstrations), estimated cost 63*l.*; Lectures at Victoria and Albert Museum—Industrial Art, by Mr. B. A. Spencer (twenty lectures), estimated cost 63*l.*

THE Norman Undercroft in Westminster Abbey is now open to the public on the payment of a small fee. This is a range of five vaulted bays entered from "Dark" Cloister, which by the removal of partitions has been made into one long chamber. This Undercroft forms the substructure of the old dormitory of the monks, part of which is now Westminster School, and is adjacent to the Pyx Chapel. The great interest of these buildings lies in the fact that they form the only complete portion now remaining of Edward the Confessor's building.

THE
# Architect and Contract Reporter.
FRIDAY, JUNE 17, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s*. 6*d*. *All business communications to the Managing Director,*

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*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*
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## NOTICE TO ADVERTISERS.

**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

## TENDERS, ETC.

⁂ *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

Ashton-on-Mersey.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

Belfast.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l*. Assessor, Sir Aston Webb, R.A. Two premiums of 150*l*. and 100*l*.; particulars 2*l*. 2*s*., returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Edinburgh.—July 9.—The Corporation invite designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

Winchester.—July 25.—Architects practising in Hampshire. Designs for elementary school buildings to accommodate 330 children. Premiums of 50*l*., 30*l*., and 20*l*. Particulars from Mr. Thomas Holt, town clerk, Guildhall, Winchester.

Mr. T. G. Jackson, R.A., M.A.Oxon, F.S.A., received on Tuesday the honorary degree of Doctor of Laws from the University of Cambridge.

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**FALKIRK IRON COMPANY**
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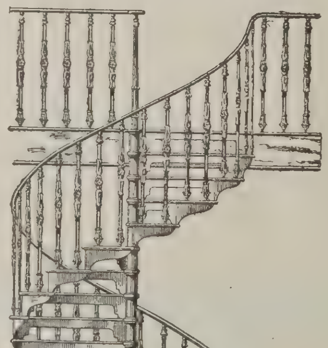

Infirmaries, Asylums, Hotels, Factories, & Public Buildings,

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**Verandahs, Balconies, Porches, Bandstands, Shelters, Gates and Railings, Columns, Brackets, Cantilevers, Balusters, Newels, &c., &c.**

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## CONTRACTS OPEN.

Adwick-le-Street.—June 29.—For erection of a mortuary chapel, caretaker's house, and board-room for the Adwick-le-Street Burial Board, Doncaster. Mr. John Simmons, C.E., architect, Bank Chambers, Doncaster.

Audenshaw.—June 28.—For the conversion of the sanitary offices at Nos. 6, 8 and 10 Guide Lane, and 2 and 4 Croft Street. Mr. J. T. Dewhurst, sanitary inspector, Council Offices, 2 Guide Lane, Audenshaw, Lancs.

Bacup.—June 23.—For erection of a post office at Bacup. Deposit 1*l.* 1*s.* The Postmaster of Bacup, or H.M. Office of Works, Storey's Gate, London, S.W.

Bath.—June 30.—For erection of mess room and office and pair of cottages at the sewage disposal site at Saltford, near Bath. Deposit 2*l.* 2*s.* Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

Belfast.—For building a veterinary establishment in Chichester Street. Mr. William J. Fennell, F.R.I.B.A., architect, 2 Wellington Place, Belfast.

Belfast.—June 23.—For erection of a disinfecting station in Lagan Bank Road. Deposit 3*l.* 3*s.* The City Surveyor, Belfast.

Blackburn.—For alterations to Central Offices and Stores, Belper Street, for the Daisyfield Co-operative Society. Deposit 1*l.* 1*s.* Messrs. Sames & Green, architects, 14 Richmond Terrace, Blackburn.

Bristol.—June 22.—For the construction of stores, showroom, offices and lavatories, at Corn Exchange Buildings, Corn Street. Deposit 2*l.* 2*s.* Mr. H. Faraday Proctor, Temple Park, Bristol.

Bury.—For erection of mortuary chapel at the Bury Infirmary. Send names to Mr. Herbert Nuttall, F.S.I., architect, 20 Market Street, Bury, Lancs.

Chacewater.—June 28.—For erection of a waiting-room and verandah at Chacewater Station, Cornwall. The Engineer, Great Western Railway, North Road Station, Plymouth.

Clatterbridge.—June 28.—For erection and completion of observation pavilion, and alterations and additions to administrative block, at the sanatorium, Clatterbridge, near Spital, for the Wirral Joint Hospital Board. Messrs. John H. Davies & Sons, architects, 14 Newgate Street, Chester.

Clayton.—June 21.—For alteration of the approach to the female infirmary at the Union Workhouse, Clayton, near Bradford. Mr. J. Harper Bakes, M.S.A., architect, Calverley Chambers, Victoria Square, Leeds.

Craghead.—June 21.—For erection and completion of a church at Craghead, S.O., Durham. Deposit 1*s.* 1*s.* Mr. Jas. W. Thompson, architect, 63 Grey Street, Newcastle-on-Tyne.

Dalton Parva.—June 23.—The West Riding Small Holdings Committee invite whole or separate tenders for the following work:—New buildings and alterations and additions to existing buildings in connection with adaptation of farm buildings at Dalton Parva (near Rotherham)—builder, joiner, slater, plumber, plasterer, painter. The West Riding Architect, County Hall, Wakefield. Send 1*l.* 1*s.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Darlington.—June 23.—For erection of a higher elementary school in Gladstone Street. Deposit 2*l.* 2*s.* Mr. George Winter, borough surveyor, Town Hall, Darlington.

Devizes.—June 28.—For the erection of waiting-rooms, footbridge, and verandah at Devizes Station, Wilts. The Engineer, Great Western Railway Station, Bristol.

Edinburgh.—June 21.—For erection of a steel and iron corn shed and drying rack, and a steel and iron hay shed at Bangour Farm, near Uphall. Offices of the Edinburgh District Board of Lunacy, Castle Terrace, or the Clerk of Works at Bangour.

Edinburgh.—June 22.—For mason, joiner, plumber, and roof tiler works of proposed pavilion for Portobello Public Park. Mr. James A. Williamson, A.R.I.B.A., City Chambers, Edinburgh.

Farnham.—June 21.—For certain repairs to be executed to Tilford East Bridge. Deposit 10*s.* 6*d.* Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Farnham.—June 21.—For erection of proposed cottages at their Ash and Hindhead depôts, for the Farnham Rural District Council. Deposit 10*s.* 6*d.* for each cottage. Mr. Arthur J. Stedman, surveyor, South Street Chambers, Farnham.

Gorleston.—June 24.—For alterations and additions to offices at Church Road school. The Borough Surveyor, Town Hall, Great Yarmouth.

Grantham.—For the construction of a drill hall at, and certain alterations to, the barracks at Grantham, for the Lincolnshire Territorial Association. Deposit 2*l.* 2*s.* Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

Halifax.—June 23.—For the various works required in erection of eight dwelling-houses, &c., in Lemington Avenue. Messrs. Medley Hall & Son, architects, 1 Harrison Road, Halifax.

Hereford.—June 22.—For erection of corrugated iron buildings in extension of the present fruit market. The City Surveyor, Town Hall, Hereford.

Huddersfield.—June 20.—For alterations and additions to the Primrose Hill Liberal Club House. Mr. Norman Culley, A.R.I.B.A., architect, 13 John William Street, Huddersfield.

Ireland.—June 20.—For erection of business premises at Newtownards. Mr. Thos. Houston, architect and civil engineer, King's Court, Wellington Place, Belfast.

Ireland.—June 21.—For repairs, alterations, &c., at Tomregan Church, Ballyconnell. Rev. M. W. Rogers, rector Tomregan Church, Ballyconnell, Co. Cavan.

Keynsham.—June 28.—For the erection of a new goods shed at Keynsham, near Bristol. The Engineer, Great Western Railway Station, Bristol.

Knowle.—June 28.—For erection of a work-room block and sundry alterations at the County Lunatic Asylum, Knowle, Fareham, Hants. Deposit 6*l.* 6*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Leeds.—June 20.—For the erection of workshops for the Gas Department in Sovereign Street. Deposit 3*l.* 3*s.* Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Leyton.—June 28.—For the construction of underground conveniences in High Road, Leytonstone. Mr. William Dawson, M.I.C.E., Town Hall, Leyton.

London.—June 20.—For supply and erection of certain iron buildings, and for the brickwork and concrete foundations thereof, for the Poplar Borough Council. The Borough Surveyor, Council Offices, High Street, Poplar, E.

London.—June 21.—For erection of extensions to the Public Offices, &c., consisting of public health, education, and other offices, also public mortuary, &c., for the East Ham Corporation. Deposit 7*l.* 7*s.* Mr. A. H. Campbell, M.I.C.E., borough engineer, Town Hall, East Ham.

London.—June 22.—For certain alterations and additions to the lavatory accommodation at the Public Baths, for the Hammersmith Borough Council. Mr. H. Mair, borough surveyor.

London.—June 22.—For erection of a sorting office at Stoke Newington, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

London.—June 23.—For providing and laying pitch-pine floor, plastering walls, and decorative work to wards Nos. 8, 16 and 17 of the infirmary, Marloes Road, Kensington, W. Mr. W. R. Stephens, clerk, Guardians' Offices, Marloes Road, Kensington, W.

London.—June 23.—For the reconstruction of existing internal fittings, and the supply and fixing of new internal fittings (in oak), for the adoption of the open access system at the Central Public Library, Mare Street, Hackney. Deposit 1*l.* 1*s.* Mr. Norman Scorgie, M.I.C.E., borough engineer and surveyor, Hackney.

London.—June 28.—For the extension of the verandah covering over the goods platform at Acton Station, for the Great Western Railway Company. The Engineer, Paddington Station, London.

Macclesfield (Chester).—June 22.—For alterations to sanitary blocks in the main building at Parkside Asylum. Deposit 1*l.* Mr. H. Beswick, county architect, Newgate Street, Chester.

Maidenhead.—July 2.—For the enlargement of the County Girls' School, Maidenhead, Berks, by the addition of a new wing. Send 2*l.* 2*s.* by June 21 to the Secretary to the Education Committee, Market Place, Reading, Berks.

Malling.—June 21.—For repairs to the Mereworth parish cottages. Mr. C. Souter, Myrtle Villa, West Malling, Kent.

Newcastle.—June 21.—For the erection of a single storey shed about 150 feet long and 70 feet wide, and alternative tenders for a shed about 240 feet long and 70 feet wide in connection with the Quay extension. Send 2*l.* 2*s.* deposit to the City Treasurer, Town Hall, Newcastle-on-Tyne. General conditions, &c., at the City Engineer's Office.

New Malden.—June 30.—For erection of Church schools at Kingston Road. Messrs. Vincent Davison & Nicol, architects, Coombe Chambers, New Malden.

Newton Abbot.—June 28.—For erection of a new goods shed, &c., at Newton Abbot, Devonshire, for the Great Western Railway. The Engineer, North Road, Plymouth.

Oldham.—June 23.—For the pulling down and rebuilding of stone wall in front of workhouse, together with wrought-iron railing for same. The Borough Surveyor's Office, Oldham.

Oswaldtwistle.—June 25.—For the erection of a school in Union Road, Oswaldtwistle, near Church railway station. Deposit 2*l*. Mr. Henry Littler, 16 Ribblesdale Place, Preston.

Poole.—June 21.—For supplying and fixing six drying horses and executing certain alterations at the workhouse laundry. The Workhouse Master, Poole.

Portsmouth.—June 27.—For erection, completion, and maintenance in thorough repair for six calendar months of a chapel, house, offices, boundary walls and fences in the new cemetery at Milton. Deposit 3*l*. 3*s*. The Borough Engineer's Offices, Town Hall, Portsmouth.

Richmond (Yorks.).—June 21.—For erection of public lavatories in the Ronaldshay Recreation Ground. Mr. H. W. Marsden, borough surveyor, Tower Street, Richmond, Yorks.

St. Albans.—July 4.—For erection of a Carnegie Public Library in Victoria Street. Send names and addresses, with 3*l*. 3*s*. deposit by June 18, to the Town Clerk, Town Clerk's Office, St. Albans.

Scotland.—June 20.—The North Berwick School Board are prepared to receive separate offers for mason, joiner, slater, plumber, and plaster works and heating apparatus for proposed additions to High School, North Berwick. Mr. James S. Richardson, architect, 14 Randolph Place, Edinburgh, or Mr. A. D. Wallace, solicitor, North Berwick.

Sawbridgeworth.—June 20.—For erection of a timber and corrugated iron bathing shed. Mr. William Morris, clerk, Council Offices, Sawbridgeworth.

Sheffield.—June 20.—For erection of rubble stone retaining and fence walls on the east and west sides of Chesterfield Road in Smithy Wood. Deposit 10*s*. The City Engineer, Town Hall, Sheffield.

Shelf.—June 27.—For the carpenter and joiner, plumber and glazier, slater and plasterer work and materials required in alterations and additions to the Variety Club, Stone Chair, Shelf, near Halifax. Mr. G. Reginald Oddy, architect, Northowram, Halifax.

Southampton.—June 23.—For the erection of (1) a chapel; and (2) lodge and offices at the Hollybrook cemetery. Deposit 3*l*. 3*s*. with the Borough Treasurer. The Borough Engineer, Municipal Offices, Southampton.

Tendring.—June 20.—For erection of a reception home for children at the workhouse at Tendring, Essex. Mr. G. H. Page, architect, Trinity Chambers, Colchester.

Wales.—For erection of portion of stands upon and enclosing of the new ground for the Cardiff City Association Football Club. Mr. E. C. Morgan Willmott, A.R.I.B.A., architect, Cardiff Chambers, 29 St. Mary Street, Cardiff.

Wales.—June 20.—For erection of fifty-four houses, &c., at Cwmdare, for the Aberdare Cottage Co., Ltd. Mr. J. Llewellin Smith, M.S.A., architect, Aberdare.

Wales.—June 20.—For erection of shops, houses, and bakehouse at Wattsville, near Cross Keys, Mon. Mr. R. L. Roberts, M.S.A., Abercarn.

Wales.—June 20.—For construction of an underground convenience in Bridge Street, Newport (Mon.). The Borough Engineer, Town Hall, Newport, Mon.

Wales.—June 21.—For erection of a police station at Tintern, Mon. Deposit 1*l*. 1*s*. Mr. William Tanner, F.S.I., county surveyor, Tintern, Mon.

Wales.—June 23.—For erection of a pair of cottage homes for children at Cwmbach, Aberdare, for the Guardians of Merthyr Tydfil Union. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—June 24.—For the construction of the necessary buildings, for the Merthyr Central Laundry Co., Ltd. Mr. C. M. Davies, M.S.A., 112 High Street, Merthyr Tydfil.

Wales.—June 25.—For erection of a vicarage and stabling at Haroldston West. Mr. Hugh J. P. Thomas, architect, 9 Victoria Place, Haverfordwest.

Wales.—June 27.—For erection by one contract of eleven covered playsheds at the Merthyr Tydfil Council schools at Pengarnddu, Penyrheolgerrig, Caedraw, Abercanaid, Troedyrhiw, Aberfan, Edwardsville, and Woodlands, for the education committee. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—June 27.—For erection of an additional pavilion, together with other work, at the Mardy Isolation Hospital, Merthyr Tydfil. Deposit 2*l*. 2*s*. The Borough Engineer, Merthyr Tydfil.

Wales.—June 27.—For work to be done and materials used in making alterations and additions for the conversion of Cyfarthfa Castle into a secondary school, and the erection of science laboratories, art and lecture rooms, with latrines, playgrounds and other works in connection therewith, for the Corporation of Merthyr Tydfil. Deposit 5*l*. 5*s*. Mr. T. F. Harvey, M.I.C.E., borough engineer, Merthyr Tydfil.

Wales.—June 30.—For erection of premises at High Street, Blackwood, for the Tredegar Industrial Co-operative Society, Ltd. Deposit 1*l*. 1*s*. Apply by June 20 to Mr. A. E. Webb, architect, 60 High Street, Blackwood, Mon.

Waterloo.—June 20.—For the erection of the Crosby Road North Council School, Waterloo, near Liverpool. Deposit 1*l*. 1*s*. Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

West Malling.—June 21.—For repairs to Mereworth parish cottages, for the Malling Rural District Council. Mr. C. Souter, Myrtle Villa, West Malling.

Winsford.—June 24.—For erection of new school buildings at Meadow Bank, Winsford, Cheshire. Deposit 1*l*. 1*s*. Mr. John H. Cooke, clerk, Winsford, Cheshire.

Worcester.—June 24.—For rebuilding in brickwork of Kenswick Bridge, on the main road between Worcester and Martley. Deposit 1*l*. 1*s*. Mr. J. H. Garrett, surveyor of county bridges, Shire Hall, Worcester.

Wrexham.—June 21.—For erection of boundary wall, gate pillars, and entrance gates and railings at the Parciau. Deposit 1*l*. Mr. John England, borough engineer, Willow Road.

Wrexham.—June 21.—For erection of a park superintendent's house at the Parciau. Deposit 1*l*. Mr. John England, borough engineer, Willow Road.

## TENDERS.

### ALSAGER.

For erection of small farm buildings at Alsager, Cheshire. Mr. T. Bibbey, architect, Cheadle, Staffs.

| | | | |
|---|---|---|---|
| Millward | £323 | 0 | 0 |
| Johnson | 296 | 0 | 0 |
| G. Edwards | 271 | 16 | 4 |
| J. Edwards, Alsager (*accepted*) | 264 | 11 | 5 |

### AUDLEY.

For erection of farm house and buildings at Audley, Staffordshire. Mr. T. Bibbey, architect, Cheadle.

| | | | |
|---|---|---|---|
| Yoxall | £1,735 | 0 | 0 |
| Wilton | 1,700 | 0 | 0 |
| F. H. & H. Maddock | 1,570 | 0 | 0 |
| Johnson, Audley (*accepted*) | 1,433 | 6 | 9 |

### DUBLIN.

For the erection of Bride's Alley artisans' dwellings, third section. Mr. C. J. MacCarthy, city architect.

| | | | |
|---|---|---|---|
| Monks | £7,550 | 0 | 0 |
| Mackey | 7,100 | 0 | 0 |
| H. & J. Martin, Belfast and Dublin (*accepted*) | 7,079 | 17 | 0 |

For electric-lighting installation in the new technical schools, Bolton Street.

| | | | |
|---|---|---|---|
| Curtis & Sons | £2,368 | 9 | 6 |
| Radiant Electrical Co. | 2,250 | 6 | 1 |
| Cummins & Sons | 2,138 | 10 | 0 |
| Dowdall & Sons | 2,042 | 15 | 0 |
| Dockrell, Sons & Co. | 1,799 | 7 | 0 |
| Ampere Electrical Co. | 1,775 | 0 | 0 |
| Egan & Co. | 1,487 | 2 | 3 |
| Johnson & Phillips | 1,433 | 14 | 5 |
| Fletcher & Phillipson, Dublin (*accepted*) | 1,273 | 7 | 6 |

### EASTBOURNE.

For extension to motor-bus depot, Roselands. Mr. A. Ernest Prescott, borough surveyor, Eastbourne.

| | | | |
|---|---|---|---|
| Martin | £3,646 | 0 | 0 |
| Dunlop | 3,538 | 0 | 0 |
| King & Son | 3,488 | 0 | 0 |
| Dennis & Co. | 3,442 | 0 | 0 |
| Hookham | 3,397 | 0 | 0 |
| Allcock, Eastbourne (*accepted*) | 3,305 | 0 | 0 |

### EAST PRESTON.

For erection of verandah to the infirmary and the conversion of existing premises as a meat store at the workhouse, East Preston, Sussex.

| | | | |
|---|---|---|---|
| Oliver & Sons | £299 | 0 | 0 |
| Drake & Co. | 230 | 0 | 0 |
| Crane Bros. | 215 | 16 | 0 |
| Smith | 215 | 0 | 0 |
| SUMMERS BROS., Rustington (*accepted*) | 198 | 12 | 6 |

### HADLEY WOOD.

For the erection of a church room on the Beech Hill Park estate, Hadley Wood. Mr. ALBERT KINGWELL, architect, Hadley Wood, Middlesex.

| | | | |
|---|---|---|---|
| Kingerlee & Son | £1,494 | 0 | 0 |
| Brightman | 1,430 | 0 | 0 |
| H. & E. Lee | 1,410 | 0 | 0 |
| Newby Bros. | 1,376 | 0 | 0 |
| Jones & Son | 1,356 | 0 | 0 |
| Staines | 1,344 | 0 | 0 |
| Fairhead & Sons | 1,337 | 0 | 0 |
| Newton | 1,319 | 0 | 0 |
| Soule & Son | 1,240 | 0 | 0 |

### HAYWARD'S HEATH.

For road making and sewering works in Petlands Road and Kents Road. Mr. GEORGE PLUMMER, surveyor.

| | | | |
|---|---|---|---|
| Osenton | £1,234 | 0 | 0 |
| Free & Sons | 1,156 | 18 | 8 |
| Blaker | 1,097 | 14 | 9 |
| Trueman | 1,083 | 5 | 0 |
| Carey | 1,062 | 0 | 0 |
| Wilcox | 1,038 | 0 | 0 |
| Mayo | 954 | 17 | 8 |
| WHITE, Hayward's Heath (*accepted*) | 944 | 17 | 11 |

### HIRST.

For twelve semi-detached houses in Woodhorn Road, Hirst, Ashington. Mr. OSBORNE BLYTH, architect, Ashington.

| | | | |
|---|---|---|---|
| McNeil | £4,980 | 0 | 0 |
| George | 4,149 | 0 | 0 |
| Contract Co. | 4,110 | 0 | 0 |
| Carrutheers | 4,098 | 0 | 0 |
| Cook Bros. | 3,909 | 8 | 6 |
| Jackson | 3,900 | 0 | 0 |
| Brown | 3,801 | 19 | 0 |
| Hornsby | 3,720 | 0 | 0 |
| White | 3,570 | 0 | 0 |
| Wood | 3,462 | 0 | 0 |
| Douglass | 3,420 | 0 | 0 |
| Carrutheers | 3,374 | 7 | 0 |
| Angus | 3,241 | 0 | 0 |
| Walker | 3,043 | 1 | 0 |
| Smith | 2,982 | 0 | 0 |
| Dykes | 2,980 | 0 | 0 |
| McMILLAN, Hirst (*accepted*) | 2,911 | 10 | 0 |

### LONDON.

For extension of ladies' cloakroom at the town hall, for the Shoreditch Borough Council.

| | | | |
|---|---|---|---|
| Sabey & Co. | £370 | 0 | 0 |
| Johnson & Co. | 353 | 0 | 0 |
| Todd & Newman | 326 | 0 | 0 |
| Grover & Son | 306 | 0 | 0 |
| Thomerson & Co. | 300 | 0 | 0 |
| Chessum & Son | 285 | 0 | 0 |
| Jarvis & Son | 275 | 0 | 0 |
| Nightingale | 266 | 0 | 0 |
| Kerridge & Son | 260 | 0 | 0 |
| Killby & Gayford | 257 | 0 | 0 |
| Schooley & Son (*recommended*) | 245 | 0 | 0 |

For constructing a 3 feet 6 inches brick and concrete culvert with manholes and other work in Hither Green Lane and Verdant Lane, for the Lewisham Borough Council.

| | | | |
|---|---|---|---|
| Fry Bros. | £1,880 | 0 | 0 |
| Adams | 1,621 | 0 | 0 |
| E. & E. Iles | 1,593 | 0 | 0 |
| Shunn | 1,580 | 0 | 0 |
| Muirhead & Co. | 1,499 | 0 | 0 |
| Pearce | 1,485 | 0 | 0 |
| Jackson | 1,462 | 0 | 0 |
| Ford | 1,455 | 0 | 0 |
| Woodham & Sons | 1,437 | 0 | 0 |
| Bell & Sons | 1,327 | 0 | 0 |
| Gibbons | 1,314 | 15 | 6 |
| Ewart | 1,260 | 0 | 0 |
| CATLEY (*accepted*) | 1,080 | 0 | 0 |

### LONDON—*continued.*

For the covering over of a portion of railway cutting in Charterhouse Street, prior to the erection thereon of buildings for market purposes, for the Court of Common Council. Mr. SYDNEY PERKS, F.S.A., F.R.I.B.A., City surveyor, Guildhall, E.C.

| | | | |
|---|---|---|---|
| Cleveland Bridge and Engineering Co. | £25,248 | 0 | 0 |
| Horsley Co. | 20,700 | 1 | 6 |
| Handyside & Co. | 19,581 | 17 | 11 |
| Morland & Son | 19,492 | 0 | 0 |
| Orr, Watt & Co. | 18,963 | 11 | 4 |
| Head, Wrightson & Co. | 18,762 | 4 | 0 |
| Shaw & Co. | 18,759 | 0 | 0 |
| E. C. & J. Keay (*recommended*) | 17,185 | 0 | 0 |

### READING.

For additions to the workhouse, Reading, for the Board of Guardians. Mr. W. ROLAND HOWELL, F.R.I.B.A., architect, Reading, and 18 Percy Street, W. Contract No. 3 includes the building of block for aged and infirm; contract No. 4 for building committee-room, mortuary, and sundry alterations to old parts of buildings; and No. 5 for heating works in the aged and infirm block.

*Contract No. 3.*

| | | | |
|---|---|---|---|
| Margett & Son | £7,530 | 0 | 0 |
| Newberry | 7,250 | 0 | 0 |
| Collier & Gatley | 7,200 | 0 | 0 |
| Curtis | 7,189 | 0 | 0 |
| Lewis & Brother | 7,127 | 0 | 0 |
| Sutton | 7,037 | 0 | 0 |
| McC. E. Fitt (*recommended*) | 6,972 | 0 | 0 |

*Contract No. 4.*

| | | | |
|---|---|---|---|
| Newberry | £1,950 | 0 | 0 |
| Margett & Son | 1,895 | 0 | 0 |
| Collier & Gatley | 1,866 | 0 | 0 |
| Curtis | 1,856 | 0 | 0 |
| Sutton | 1,840 | 0 | 0 |
| Lewis & Brother | 1,833 | 0 | 0 |
| Patience & Sons | 1,788 | 0 | 0 |
| McC. E. Fitt (*recommended*) | 1,743 | 0 | 0 |

*Contract No. 5.*

| | | | |
|---|---|---|---|
| Hart & Son | £624 | 0 | 0 |
| Toogood & Co. | 576 | 0 | 0 |
| Spencer | 500 | 0 | 0 |
| Tucker | 496 | 0 | 0 |
| Goodman | 475 | 0 | 0 |
| Callas, Sons & May, Reading (*recommended*) | 379 | 0 | 0 |

### SOUTHBOROUGH.

For sewage tanks and bacteria beds. Mr. WILLIAM HARMER, engineer, Council Offices, Southborough.

| | | | |
|---|---|---|---|
| Smith & Co. | £2,484 | 18 | 5 |
| Martin & Co. | 2,314 | 0 | 0 |
| Osenton | 2,289 | 12 | 5 |
| Crates & Son | 2,271 | 4 | 4 |
| Punnett & Sons | 2,160 | 0 | 0 |
| JARVIS, Tunbridge Wells (*accepted*) | 2,060 | 0 | 0 |

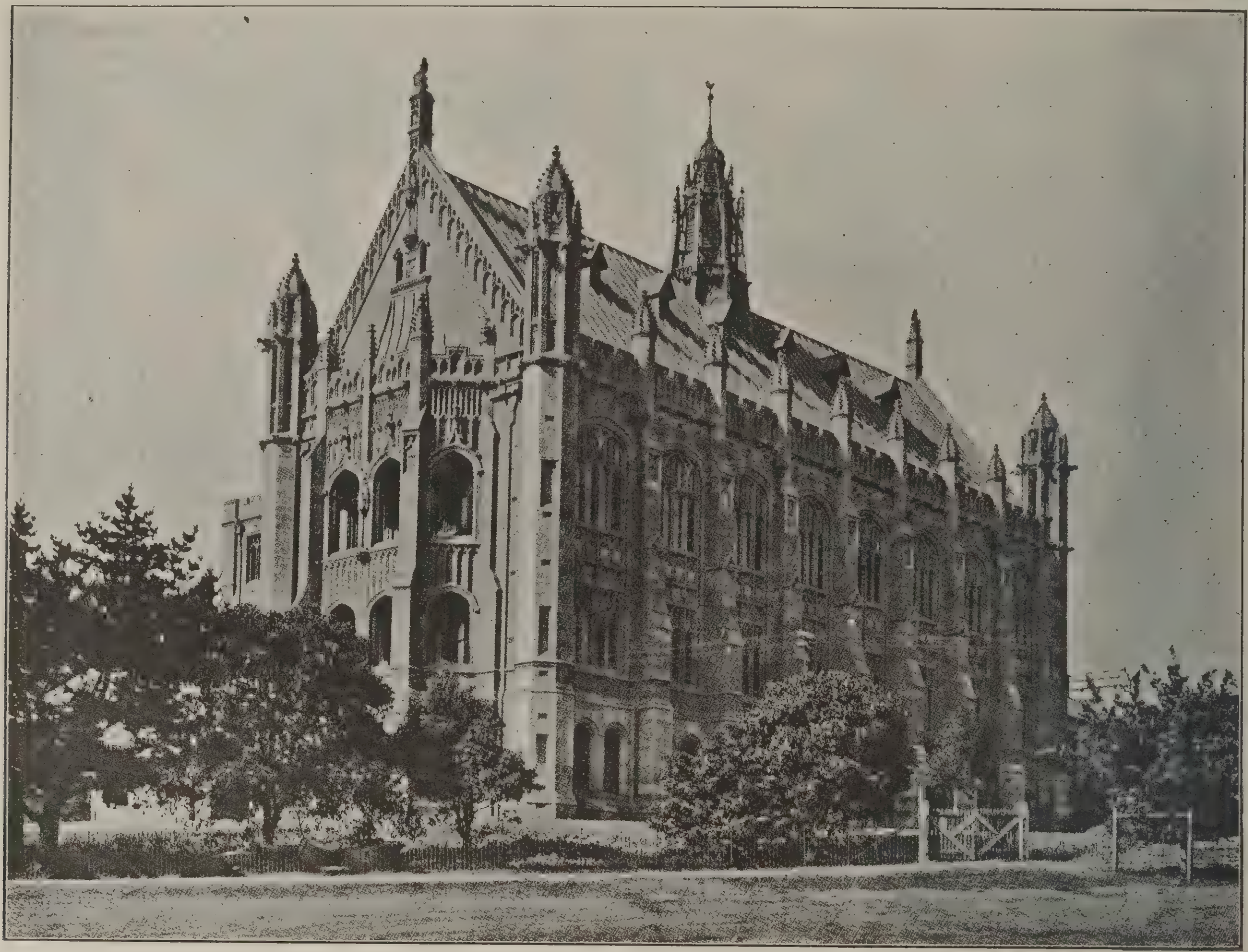
### WALES.

For erection of an isolation hospital for the Gelligaer Urban District Council. Mr. P. V. JONES, architect, Hengoed.

| | | | |
|---|---|---|---|
| D. Jones | £11,453 | 0 | 0 |
| Davies | 11,057 | 0 | 0 |
| Hancock | 10,680 | 0 | 0 |
| Griffiths & Sons | 10,248 | 0 | 0 |
| Knox & Wills | 10,000 | 0 | 0 |
| Walters & Son | 9,937 | 0 | 0 |
| James & Morris | 9,712 | 0 | 0 |
| Jones Bros. | 9,660 | 0 | 0 |
| Shaile | 9,625 | 0 | 0 |
| Howells | 9,519 | 0 | 0 |
| Davies & Sons | 9,489 | 0 | 0 |
| Voddon & Lee | 9,418 | 0 | 0 |
| Turner & Sons | 9,359 | 0 | 0 |
| Davies & Howell | 8,680 | 0 | 0 |
| R. Jones | 8,452 | 0 | 0 |
| LLOYD, Ystrad Mynach (*accepted*) | 8,000 | 0 | 0 |

For the erection of a church hall at Barmouth, N. Wales. Mr. JOHN DOUGLAS, architect, Chester.

| | | | |
|---|---|---|---|
| Lloyd & Williams | £1,963 | 14 | 1 |
| Edwards | 1,947 | 0 | 0 |
| Jones & Son | 1,920 | 0 | 0 |
| Griffith & Son | 1,716 | 0 | 0 |
| ROBERTS, Barmouth (*accepted*) | 1,669 | 0 | 0 |
| Browne | 1,592 | 11 | 0 |



THE FISHER LIBRARY, SYDNEY, NEW SOUTH WALES.

## ARCHITECTURE IN NEW SOUTH WALES.

(*Continued from last week.*)

*The Fisher Library.*—There has been secured for Australian students of architecture in the Sydney University buildings, and in this its latest addition, an example of a peculiarly British type that may be safely claimed to present in its general features and its correctness of detail the true spirit of the Perpendicular Gothic.

Designs and estimates of cost of a suitable building were prepared, and the scheme having been fully inquired into by the Parliamentary Standing Committee on Public Works, and recommended for adoption under the provisions of University of Sydney (Fisher Library) Act, 1901, the undertaking has been realised. After seven years of continuous work, and at a cost of 72,000*l*., the building now, in July 1909, stands complete.

It was a happy inspiration that led the Senate in its early days to stamp its immediate and future buildings with the graceful and characteristic style of the British Perpendicular Gothic—a type which admits much individuality and rich effects not obtainable in the colder and more unbending lines of Pagan Classic.

Building operations were commenced on January 23, 1902, and for several years the fabric quietly progressed under but little public observation, the basement storey in hard Purgatory stone, and the upper portions in the best Pyrmont, for which Sydney is famous, until the topmost finial was reached, and the appropriate and emblematic enrolments executed by one of the best Gothic carvers in Australasia, his services extending over a continuous period of three years.

Every detail of the stonework and of the construction was carefully worked out by the draftsmen, and the quality of the work itself shows that the handicraft and cunning that built the masterpieces of England is still to be found with the stonemasons of New South Wales.

The designing and construction of the Library roof itself was necessarily a matter of great consideration; the adoption of the fan-traceried stone groining exemplified at Christ's College, Cambridge, was (generous as the Government was disposed to be) out of the question, but in adopting the alternative of the hammer-beam roof—also characteristic of the style—it was possible to construct an enduring example in and memento of the fast-disappearing cedar of the east coast of Australia. The quantity required for the Library roof was 175,000 superficial feet, and to obtain this 300,000 superficial feet had to be secured. The immediate result of so large an addition to local requirements was such that the price advanced from 5*d*. to 8*d*. and 10*d*. per superficial foot.

The quantity of 175,000 feet will perhaps be better realised when it is understood that 300 logs, each of 1,000 superficial feet, 16 feet by 3 feet diameter, had to be felled and transported to Sydney.

This type of hammer-beam roof is purely the product of English soil, nothing on the Continent being comparable with it, either in construction or outline.

Its chief characteristic is the method by which the thrust is brought low down, thereby lessening the horizontal pressure against the walls.

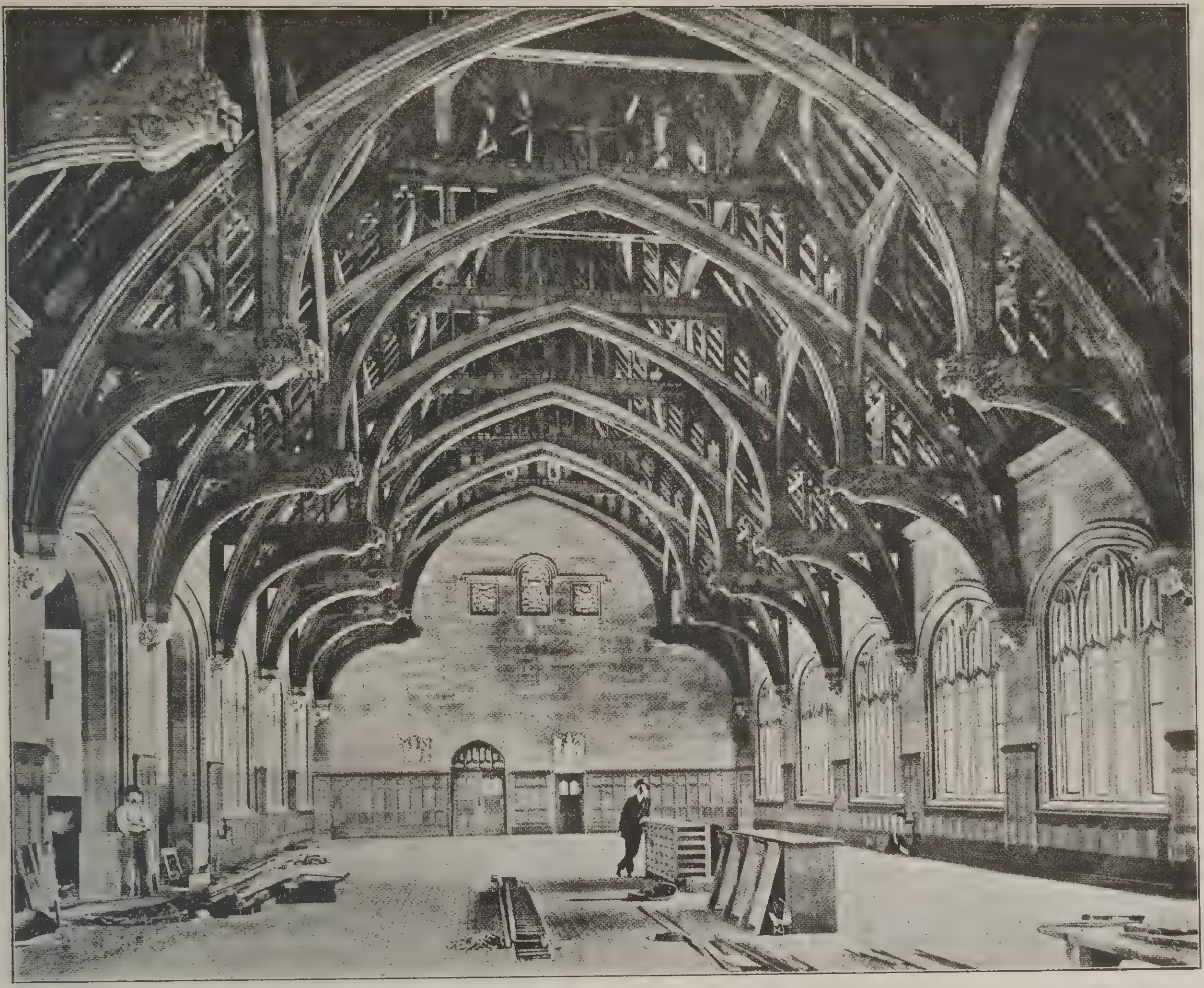
The most beautiful and wonderful in the long series of this type of roof is that of Westminster Hall, the original meeting-place of the British Parliament. It was erected by Richard the Second in A.D. 1397, and remains untouched and without alteration to the present time.

Pugin gives the following dimensions of the principal roofs of this type in Great Britain, to which are added those erected at the University of Sydney:—

| | Span Width. | Height. | Length. |
|---|---|---|---|
| Westminster Hall ... | 68 | 85 | 238 |
| Fisher Library, Sydney | 50 | 58.6 | 122 |
| Guildhall, London ... | 48 | 55 | 153 |
| Great Hall, Sydney ... | 46.6 | 70 | 135 |
| Hampton Court ... ... | 40 | 45 | 108 |

A very interesting comparison can therefore be made, and it may be claimed that both the Fisher Library roof and that of the Great Hall take high rank amongst these architectural triumphs, the first-named standing second only in span (which is the crucial feature in roofs of this description) to that of Westminster.

2. *Adaptability of Buildings for their Special Uses.*—It has always been the policy of the Branch to closely associate itself with the responsible and able officials in the



THE FISHER LIBRARY, SYDNEY, NEW SOUTH WALES.

Government Service controlling the various departments and their institutions, and to ensure that their views are studied and their special requirements provided for. Consequently the Government Architect has endeavoured to ensure the fullest applicability of these buildings, resulting in their general design and arrangements (as distinct from their extent) bearing favourable comparison with those of similar purpose elsewhere.

In the designing of hospitals for the insane of the more modern type, Kenmore stands perhaps as an example of an institution symmetrically congregated in all its parts; and generally in principle, but subject to exigencies of site, is being followed by that now being designed for Orange, each of these institutions being designed with capacity up to 900 patients. A new departure in hospital designing, as far as New South Wales is concerned, is already in course of development at Morisset, a most attractive estate on the western shores of Lake Macquarie, and also of similar capacity to Kenmore Hospital. Here Dr. Sinclair, the Inspector-General of the Insane, is putting into practice his special views, and the Branch has already designed and erected the first buildings of a segregational scheme, in which the completed whole, while bearing a proper relation to each other, will be arranged with as marked an absence of "institution," but with suggestion of "community of homes" as is possible. The nature of the site specially lends itself to this ideal.

Already the first pavilion for males to accommodate 100 patients has been erected and temporarily occupied at a cost of 10,000*l*., or 106*l*. per bed. It contains on the ground floor:—Dining-room, 42 feet by 38 feet; two dormitories, 53 feet by 38 feet; seven single rooms, together with dressing-room, lavatories, and pantry. And on the first floor are three well-lighted dormitories, extending over the whole area of the building. The floor space per head is 44 superficial feet, and the building is of brick with stone dressings.

Amongst the buildings recently erected at the hospitals for the insane at Gladesville, Kenmore, Rydalmere, and Parramatta, are special admission blocks or mental hospitals of the most recent type, and designed for the special observation of patients before classification.

The group of these buildings at Parramatta may be taken as typical. It consists of one wholly detached ward each for males and females, and each ward is so arranged as to admit of treatment of three separate groups of patients.

There are also to each ward two dormitories, each containing ten beds, and four single rooms for more acute cases. Each dormitory and the group of single rooms is provided with a separate day-room, bath-room, pantry, &c.

The administrative block specially attached to this group of wards is placed between them, and contains matron's and nurses' quarters, examining-room, operating-room, and visitors' waiting-room on the ground floor, and nine staff bedrooms on the first floor.

The whole group, when completed (one ward at present ready for occupation) will have cost 14,000*l*.

Dr. Sinclair's scheme is a distinct advance so far as the designing of hospitals for the insane in New South Wales is concerned. The buildings are intended to accommodate the newly-arrived patients, who are placed there under special observation for periods varying from one to six months. Whilst in these admission blocks these patients are not considered to be inmates of the institution in the full sense of the term, and if discharged from these direct, they avoid to a great extent the stigma which is so generally considered to attach to the insane.

The standard cost of the State Hospitals for the Insane, in which the accommodation is most liberal, the appliances and fittings of the latest and best types, and the designs, both externally and internally, attractive to the eye, does not exceed 250*l*. per bed for the acute, and 200*l*. per bed for chronic cases.

(*To be concluded.*)

## THE ALEXANDRA SLATE QUARRIES.

IT is something over 200 years since the use of Welsh slates became general throughout the country. The exploiting of this great industry was primarily due to the businesslike instincts of Mr. Richard Pennant, a Carnarvonshire landowner, who converted a purely local industry into one with ramifications all over the globe. In no country in the world has the art of slate quarrying reached such proportions as in the British Isles, and especially in North Wales, where the working of slate mines and quarries is the staple industry of the mountainous regions of Merionethshire and Carnarvonshire.

No. 1 PIT—WEST SIDE.

A typical instance of a progressive quarry is that of the Alexandra Slate Co., Ltd., which is situated on the summit of Moel Tryfan, near Nantlle, in Carnarvonshire. This quarry stands about 1,400 feet above the sea-level and geologically is very interesting. Indeed, some years ago the Royal Society thought fit to send a committee down to investigate the traces of glaciers which are to be found in the deposits of shell and sand in the neighbourhood. It may here be mentioned that the slate bed in North Wales starts at Aber, on the north coast, extends through Bethesda, Llanberis, Moel Tryfan, through the Nantlle Valley, and turns towards the sea-coast at Clynog.

No. 1 PIT—SOUTH SIDE.

In the Alexandra Quarry there are three formations, viz. red, blue, and purple. The slate is obtained out of three pits, of which the deepest is over 400 feet below ground level. The slate is in the first place loosened by blasting. This is done by drilling holes in the rock by compressed air. The compressors are of the Ingersoll Rand type, and the drills are of various makers. Next the explosive is inserted, and, after the men have taken shelter, is fired, which loosens the solid slate and renders it easy for the men to finally bring it down. The blocks are then removed from the quarry by means of the hoisting machinery, which is of the pit headgear and blondin types. The latter is the latest method of hoisting and permits of the waggon being stopped or lifted at any point on the cable way. The instructions to the blondin engine-driver are given by ship's telegraph from the edge of the quarry.

The blocks having been brought to the ground-level are conveyed in trucks to the sawing mills, which are elaborately equipped for the rapid production of finished slates. On reaching the mills the blocks are lifted from the trucks by hand cranes and are then split by the slatemakers preparatory to being sawn across the grain, after which the slates are again split and finished by machine dressers. The sawmill is worked by a suction gas engine. This, it is interesting to note, works out at about one-fourth the cost of steam power.

No. 3 PIT.

SAWING MILL.

The finished slate is finally packed into trucks and conveyed on the private railway which links the quarry with Bryngwyn, nearly two miles distant. Here it runs on to the North Wales narrow gauge railway, and finally to all parts of the kingdom.

The head office of the company is on the Slate Quay at Carnarvon. This office and the quarry are in communication, a private telephone having been laid down along the intervening four miles.

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"To and Fro—The Key to London," has completed its first year of existence. This valuable sixpenny monthly guide has increased in popular favour as the public have learned to appreciate its unquestioned usefulness. The area covered has during the year been extended to the suburbs wherever a tram, 'bus, motor-'bus, or District train runs. The instructions for use have been still further simplified, and various corrections, with alterations in arrangement, &c., have been made. Japanese instructions have been added to the French, German and Spanish.

THE general purposes committee of the Gillingham Town Council have been instructed by the Council to take into consideration the question of the provision of a town hall for the borough, the need of which has long been felt. The buildings at present at the disposal of the Council are only of a temporary character, and are quite inadequate for a town of the size and importance of Gillingham.

## TRADE NOTES.

The Midland Heating and Ventilation Co., Ltd., of Upper Trinity Street, Birmingham, have secured the contract for heating the Royal Scottish Academy, Edinburgh.

A large clock with Cambridge chimes and 7-feet dials has just been erected in the parish church, Chatteris, Cambs., by John Smith & Sons, Midland Clock Works, Derby. It is fitted with all the latest improvements and generally to the designs of the late Lord Grimthorpe, and is guaranteed by the makers to maintain time with great accuracy.

Visitors to the Royal Agricultural Show, which opens at Liverpool on June 21, should look in at Stand No. 78, where Messrs. Merryweather & Sons will have a large exhibit of fire appliances and water-supply apparatus, suitable for country houses, farms and estates, as well as a selection of their patent spraying apparatus. A special feature of the exhibit is the various types of motor fire engines. There will also be horse and hand draught steam fire engines, fire hose and fittings, and several novelties in the shape of petrol-driven pumps for water supply, fruit spraying, and irrigation.

Messrs. Wm. Potts & Sons, Ltd., clock manufacturers, Leeds and Newcastle, have recently erected large clocks at the following places:—Bretton Park, Wakefield, for the Rt. Hon. Lord Allendale; Cleckheaton secondary school, Yorks; Selaby Hall, Co. Durham; Hull Garden City, Hull, East Yorks. They are now erecting a memorial clock and bell at the Mechanics' Institute, Marsden, Yorks, and an illuminated clock for Spennymoor, Durham, an illuminated chime clock for Ebchester parish church, Co. Durham, and an hour striking clock for Whaddam Church, near Bletchley, Bucks.

Messrs. Sibley & Co., Bridge House, Queen Victoria Street, E.C., have put on the market a w.c. cistern which promises to be free from those minor defects which are still continued in the usual types. Its name, "Newland's Patent Double Flush Water-Waste Preventer," shows its main improvement. The cistern is divided into two chambers in order that a second flush may be obtained immediately after the first without waiting for the cistern to refill. The refilling is rapid as the water is not even partly shut off until the water-line is reached; when this is done the striking handle is thrown into position automatically. The filling is practically silent owing to the anti-syphoning tube being placed in a lower chamber than the syphoning tube. A tap is fixed to the inflowing pipe, so that when the house is empty or the weather frosty the supply can be cut off. The improved syphoning plungers are each coned at the top on the inner side; this enables them to be made 5 lb. lighter and at the same time causes the water to absolutely syphon at each operation, thus overcoming the annoyance of having to pull the handle two, three, or more times before the water flushes.

## VARIETIES.

The Hereford fruit market is to be extended and improved at a probable cost of 5,000*l*.

Chemical works are to be erected in Maryport, West Cumberland, on a site close to the docks.

The Surbiton Urban Council have given their approval to a new sewerage scheme which it is estimated will cost 63,500*l*.

Mr. H. L. C. Brassey, M.P., has promised to completely restore Wood Newton Church, Northamptonshire, in memory of the late King Edward.

The Berkshire Local Education Authority have given formal notice of their intention to erect a school for about 220 children in Thatcham.

The Chilian Government are raising a new loan, of which 1,100,000*l*. is to be expended on continuing the reconstruction of Valparaiso.

The Ecclesiastical Commissioners have made a grant of 400*l*. to meet an equivalent amount for the erection of a parsonage at Bobbing, near Sittingbourne.

Plans for the erection of property representing a value of, roughly speaking, 17,000*l*., were presented at the Dunfermline Dean of Guild Court last week.

Mr. Nathaniel Armstrong, Dilston Cottage, Newcastle-on Tyne, formerly well known in the building industry, left estate valued at 31,480*l*. gross, with net personalty 15,187*l*.

The Leeds City Council have given public notice of their intention to erect an elementary school for about 550 children in Lawns Lane, Farnley.

The Governors of George Heriot Trust, Edinburgh, accepted a gift by Mr. H. J. Blanc, R.S.A., of 500*l*., to provide a bursary for a pupil of the school who desired to devote himself to the study and practice of the art of architecture.

The *Diario Oficial*, Uruguay, of April 26, publishes a decree earmarking a sum of 241,000 pesos (about 51,000*l*.) for the construction of 210 rural schools, and for the provision of scholastic materials.

A Local Government Board inquiry will be held on the 21st inst., into the application by the Berks County Council for permission to borrow 19,276*l*. for the provision of county offices in the Forbury, Reading.

The designs of Mr. J. W. Winter, architect, of Sheffield, for the erection of a Primitive Methodist church and schools at South Elmsall, near Doncaster, have been accepted. His designs for a school church at Kinsley have also been adopted.

Olantigh Towers, Wateringbury, Kent, the mansion belonging to Mr. W. E. Sawbridge-Erle-Drax, which was destroyed by fire some years ago, is to be rebuilt at a cost of about 10,000*l*. Messrs. Wallis Bros., of Maidstone, have secured the contract.

The streets committee of the Court of Common Council in answer to a letter from the Southwark Borough Council, have expressed the opinion that the fees payable to district surveyors in respect of "additions, alterations, or other works," made to existing buildings, required revision.

H.M. Consul at Buenos Aires (Mr. A. C. Ross, C.B.) reports that at the close of 1909 the building trade in Buenos Aires was very active. Owing to the increased value of land in the business part of the city, that portion of it is being practically rebuilt with steel frame houses.

A Local Government Board inquiry was conducted last week in the Newport Town Hall, by Mr. H. R. Hooper, M.I.C.E., L.G.B. Inspector, relative to the Corporation's application for leave to borrow 31,255*l*., as additional capital for the purpose of the electricity undertaking. The money is to be expended on the purchase of improved plant.

The Birmingham cathedral tower committee has just issued an appeal for the remainder of the funds required to enable it to carry out its work. The outer casing of the tower, which has remained untouched since its erection 200 years ago, has for some time past shown signs of decay, and restoration is an urgent necessity.

There will be held during the present season an exhibition of the work of the late George du Maurier, of *Punch* and "Trilby" fame. A very representative collection is being got together, and it will comprise some of his most famous drawings. The exhibition will cover a period of over twenty years from 1874 to his death in 1896, and will be held under the title of "Society in late Victorian days," at the Leicester Galleries, Leicester Square.

The Glasgow Corporation Tramways Department have been granted lining for the erection of a sub-power station in New Bridge station, Partick. This station is to take the place of the present station in Hayburn Street, which has been found too small. The new station will receive power direct from Pinkston, and will transform the current as required for the tramways in the district. The estimated cost of the buildings is 7,000*l*.

A special number of *The Local Government Journal and Officials' Gazette*, with an illustrated supplement, has been published to commemorate the 2,000th issue of that old-established paper. In referring to these interesting facts the Editor says:—"The paper was founded more than thirty-eight years ago for the purpose of opposing centralisation, and of supporting, encouraging and improving self-government, particularly in the Metropolis, where it was chiefly threatened."

H.M. Consul-General at Budapest (Mr. Esmé Howard, C.V.O., C.M.G.) reports that there is very great activity in the building trade at Budapest this year, and that orders have been given for nearly the whole available supply of bricks. The municipality of Budapest are erecting two brick works of their own with a yearly capacity of 70,000,000 to 80,000,000 bricks; these works it is hoped to have in working order next year. This year they propose to use cement for various buildings, such as workmen's dwellings and possibly a hospital.

At the last meeting of the Basford District Council, the authority controlling the district surrounding the city of Nottingham, the medical officer of health (Dr. Wray) declared that if the Town Planning Act were enforced in that area it would mean the closing of one-third of the houses. If he reported on all the property which did not comply with the Act, he would not be safe in any parish. The Chairman said that under one or other requirement of the Act, five out of six houses in the district would have to be condemned, and the population would be homeless. The medical officer was directed to draw up a special report.

At the last meeting of the Glasgow Dean of Guild Court the principal linings granted were:—Glasgow School Board, to alter and add to Anderston special school, Hydepark Street, and to erect offices at 125 to 133 Bath Street; Arthur Mechan's trustees, brassfounders, to erect buildings at 38 Elliot Street; Smith's Glasgow Crucible Co., Ltd., to alter and erect buildings in Fauldhouse Street and Bilbao Street; Alexander F. Sinclair, to erect buildings in Manor Road, Bellahouston.

Asphalt.—The aggregate quantity of asphalt exported from the province of Syracuse, Sicily, during the year 1909 was 94,449 tons; of this amount 46,795 tons of rock asphalt, 4,227 tons of powder in bags and 1,845 tons in blocks of compressed bitumen were shipped from Syracuse. The various destinations of these exports from Syracuse were:—America, 1,000 tons; Austria-Hungary, 2,039 tons; United Kingdom, 6,394 tons; Egypt, 2,020 tons; Germany, 27,957 tons; Greece, 2,555 tons; Netherlands, 6,407 tons; Italy, 1,142 tons; Spain, 130 tons; Colombo, 550 tons; Calcutta, 1,050 tons; Russia, 450 tons; Braila, 973 tons.

"The City of London Year-Book and Civic Directory" for 1910 (London: W. H. & L. Collingridge) is the long-established "City of London Directory" in a new form. The main difference is that the customary coloured map, together with the streets, trades, and commercial sections, have been omitted. The chief contents of the annual as now issued are the Corporation and London County Council directories; lists of members on the Stock Exchange, Lloyd's and the Baltic; Livery Companies' guide and list of members; the House of Commons 1910; information as to the City schools, hospitals, charities, churches, Territorial Forces; and the usual short section giving biographical notes on prominent City people. The volume is both admirable and valuable.

The manager of the Carlisle Labour Exchange states in regard to the expected scarcity of bricklayers in West Cumberland, and the proposal to bring men from Belgium, that he is at present obtaining particulars of all the available men in the United Kingdom, and expects to be in a position to supply the class of bricklayers wanted for the erection of coke ovens. The firm who have the work in hand have intimated that they will avail themselves of the Labour Exchange organisation, so that the men who have been used to this class of work will be brought by the Carlisle Exchange from the various towns as required.

The Paisley Town Council have decided to have the work in connection with the extension of the Powbank reservoir entered on at the end of June. This extension will be practically a new reservoir, formed to the south of the present one, and when completed the storage capacity at Powbank will be fully 1,100,000,000 gallons, giving over 100 days' supply. At the present time the supply is equal to 4½ months, and with the additional storage it will be equal to about eight months, which will be quite sufficient to meet the requirements of the town for the next twenty years. It is estimated that the cost of the Powbank extension will be about 50,000*l*.

New iron works are to be put up at Palermo, Sicily, during the present year, through the initiative of the Società Anonima Ferri e Metalli, which has a capital of 70,000*l*. The works will occupy an area of 52,000 square metres near the Lolli Station. It is estimated that the mean production of iron and steel will be 50 tons per diem in piping of 1 millim. thickness, round and square iron of 5 to 70 millims. section, "poutrelles" or joints of 180 millims. section, and profile iron of 100 millims. The works will have 12,000 horse-power; the accessory machinery will be worked from a central electric plant. The municipality of Palermo is said to have granted ten years' exemption from town dues on products introduced into the town, and other facilities, while the Chamber of Commerce has also waived its tax for the same period.

The contract for a scheme of water supply for the town of Woburn, Bedfordshire, including part of the Woburn estate, for his Grace the Duke of Bedford, has been let to Mr. John Lant, Newcastle-on-Tyne. The work embraces the laying of a considerable number of miles of 6, 4, and 3-inch cast-iron pipes with stop, scour, and air valves, pillar wells, &c., as well as the necessary connections up to the boundary properties. The water is to be procured from a reservoir at Bowbrickhill Heath, which gives ample pressure over the district to be supplied. The engineers are Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne. A scheme of main sewerage and sewage disposal along with a complete scheme of surface water drainage is also to be carried out by the same contractor.

The Buildings Sub-Committee of the London County Council Education Committee estimate an expenditure of 32,000*l*., which will be chargeable wholly to maintenance account. One of the items is the strengthening of hall floors for physical exercises. This item appears for the first time. The general question of the vibration of hall floors has been under consideration for some time. The architect is engaged in making a special survey, and up to the present time has presented his report on 226 schools, leaving about 280 schools still to be reported upon. In some of the cases the upper floors can only be used under certain limitations, while in others all mass movements are prohibited. A scheme for dealing systematically with the strengthening of these floors will be drawn up and considered in connection with the annual schedule of minor improvements to schools.

The Building Industries Association, at a meeting held on the 9th inst., at Anderton's Hotel, Fleet Street, unanimously decided to amalgamate with the Land Union. The chairman, Mr. H. R. Selley, said the Association was not losing its identity, as its committee would still be there *en bloc*. The following resolution was carried unanimously:—"That this meeting of builders and others, being subscribers and supporters of the Building Industries Association, having heard the resolution of their committee, which was unanimously adopted, hereby confirms such resolution, and instructs its treasurer to close the accounts and hand over any surplus to the Land Union for propaganda work, and further pledges itself to support in every way the Land Union in its strenuous opposition to the new land taxes. It further resolves that the names of such of the members of the present committee who are willing to become members of the Land Union be submitted to the Council of the Land Union for election to its building and allied trades committee."

An interesting exhibition of pictures by M. Robert Demachy, a well-known French photographer, is now on view at the House of the Royal Photographic Society, 35 Russell Square, W.C. Some fifty-seven examples, being the pick of his past year's work, are on the walls, and represent his latest development in the use of the new oil printing process, by which the photographic picture is made visible by the addition of a specially prepared oil pigment, thus affording great scope for personal interpretation of the subject. M. Demachy has clearly demonstrated the power the new printing process places in the hands of a man gifted with that artistic feeling. The exhibition will remain open free to the public daily till July 30, 11 A.M. till 5 P.M., Saturdays 11 A.M. till 2 P.M.

Messrs. W. H. Smith & Son have offered the London County Council a rent of 265*l*. a year for a lease for 99 years of a site on the west side of Kean Street, Kingsway. The site, which is the only remaining piece of vacant land at this part, has an area of about 2,470 square feet with a frontage to Kean Street of about 34 feet 8 inches. The offer is made subject to the condition, amongst others, that no objection will be raised to the building on the site being erected to a height of 60 feet, the width of the street being 40 feet. The Building Acts committee state that they will be prepared to consider such an application. The site has not been submitted to auction, but boards have been erected on which notices have been displayed intimating that the land is to be let. The offer is considered reasonable, and its acceptance is recommended.

The constant succession of burglar reports which appear in the daily papers, not to mention the numerous instances which never gain publicity, show that the burglar's art is in no danger of decay from lack of enterprising followers. Indeed this calling is followed with an energy and skill which would assuredly gain honour if applied to other spheres. Unfortunately until this perverse use of genius ceases it has to be met by cleverness greater than its own. Much time and money has been expended on inventions which should defy the entry of or opening by unauthorised persons. Many have failed when professionally tested; others of scarcely greater use being too expensive for an ordinary purse. Consequently there is still plenty of scope for further research. The problem has special attractions for some people and new ideas are constantly appearing. One such is now being shown by Mr. S. Lichtenfeld, at 300 Regent Street, W. The principle of this invention is that at the mere approach of any unauthorised person towards a protected door, safe, window, stairs, or the like, the electric lights over the whole house are illuminated automatically; they can only be switched off again by someone in possession of the secret mechanism. At the same time the device summons the police; if desired it can also be made to sound an alarm inside or outside the house. The apparatus involved is so compact as to be conspicuous for its absence; in fact if desired it may be placed completely out of sight. Its efficacy is none the less most striking, judging by the experiments.

THE

# Architect and Contract Reporter.

FRIDAY, JUNE 24, 1910.

*Published weekly, subscription* 19*s. per annum for Great Britain, and for Colonial and Foreign subscriptions* £1 6*s.* 6*d. All business communications to the Managing Director,*

*P. A. GILBERT WOOD,*

*Publishing Offices,* 6-11 *Imperial Buildings, Ludgate Circus, London, England.*

*Telephone No.* 4725 *Holborn.*

*Branch Offices at* 43 Old Queen Street, S.W., *Messrs. W. HAY FIELDING & CO. being the representatives for all business purposes.*

*The Birmingham Offices are at* 102 Colmore Row.

*** *Entered in the United States of America as second-class matter.*

AGENTS FOR AMERICA:

*The International News Co.,* 5 *Bream's Buildings, Chancery Lane, London, England, and New York.*

AGENTS FOR CANADA:

*Messrs. WM. DAWSON & SONS, Ltd., Manning Chambers, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.*

*Subscription* $5.20.

AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

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South Africa: *Central News Agency, Ltd.*

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**Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.**

## EDITORIAL NOTICES.

*The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.*

## TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 p.m. *on Thursdays.*

## COMPETITIONS OPEN.

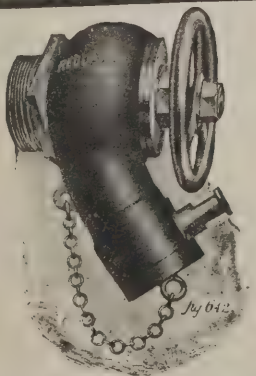
Ashton-on-Mersey.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

Belfast.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l*. Assessor, Sir Aston Webb, R.A. Two premiums of 150*l*. and 100*l*.; particulars 2*l*. 2*s*., returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Edinburgh.—July 9.—The Corporation invite designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

Winchester.—July 25.—Architects practising in Hampshire. Designs for elementary school buildings to accommodate 330 children. Premiums of 50*l*., 30*l*., and 20*l*. Particulars from Mr. Thomas Holt, town clerk, Guildhall, Winchester.



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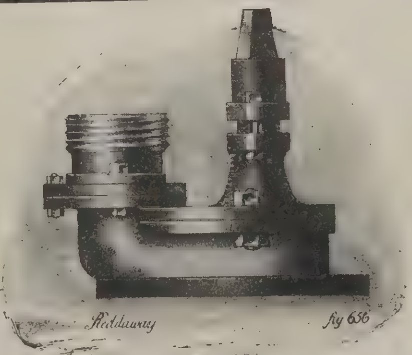

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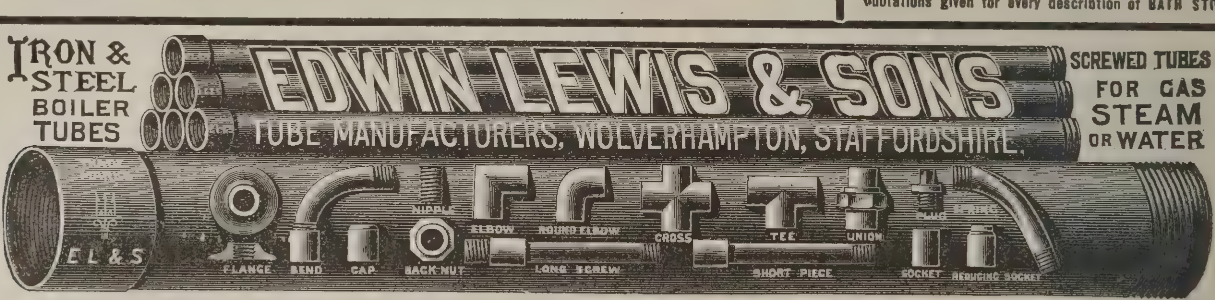

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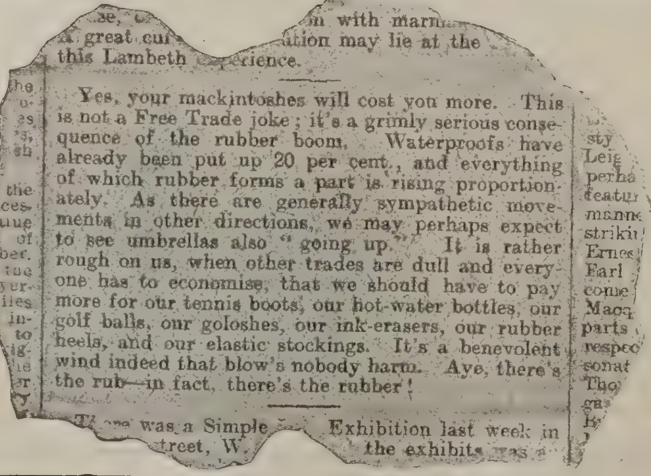

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a great cu… ation may lie at the
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## CONTRACTS OPEN.

Adwick-le-Street.—June 29.—For erection of a mortuary chapel, caretaker's house, and board-room for the Adwick-le-Street Burial Board, Doncaster. Mr. John Simmons, C.E., architect, Bank Chambers, Doncaster.

Arlington.—June 25.—For erection of a class-room, &c., at the Council public elementary school at Arlington (Park Mead), East Sussex. Send names and addresses to Mr. F. J. Wood, county surveyor, County Hall, Lewes.

Ashington.—July 12.—For the erection of council chamber, offices, and caretaker's house in Station Road. Deposit 2*l.* 2*s.* Mr. Osborne Blythe, architect, Ashington.

Audenshaw.—June 28.—For the conversion of the sanitary offices at Nos. 6, 8 and 10 Guide Lane, and 2 and 4 Croft Street. Mr. J. T. Dewhurst, sanitary inspector, Council Offices, 2 Guide Lane, Audenshaw, Lancs.

Barnsley.—June 30.—For the removal of two galleries in the infants' department of Ardsley (Barnsley) Council school, Barnsley Road, Stairfoot (trade, joiner). Mr. T. Graham, W.R. Education Offices, Obelisk Chambers, Barnsley.

Bath.—June 30.—For erection of mess room and office and pair of cottages at the sewage disposal site at Saltford, near Bath. Deposit 2*l.* 2*s.* Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

Belfast.—June 27.—For erection of chimney shaft and flue connections at the electric power station, Belfast. Send 3*l.* 3*s.* deposit to the City Chamberlain. The City Surveyor, City Hall, Belfast.

Burton Pedwardine.—July 9.—For alterations and repairs to the Burton Pedwardine Council school. The County Surveyor, 53 High Street, Grantham.

Chacewater.—June 28.—For erection of a waiting-room and verandah at Chacewater Station, Cornwall. The Engineer, Great Western Railway, North Road Station, Plymouth.

Chippenham, &c.—July 2.—For work to be done in the internal and external renovations to Chippenham police station, also police cottages at Highworth, Ludgershall, and Shrewton, for the Wilts County Council. Mr. J. George Powell, county architect and surveyor, Trowbridge.

Chipping Ongar.—July 6.—For the execution of (a) general painting and repairs, (b) tiling and roof repairs, and (c) alteration to kitchen in administrative block at the children's homes at Chipping Ongar, Essex, for the Guardians of Hackney Union. Mr. Frank R. Coles, clerk, Guardians' Offices, Sidney Road, Homerton, N.E.

Clatterbridge.—June 28.—For erection and completion of observation pavilion, and alterations and additions to administrative block, at the sanatorium, Clatterbridge, near Spital, for the Wirral Joint Hospital Board. Messrs. John H. Davies & Sons, architects, 14 Newgate Street, Chester.

Cononley.—June 29.—For mason, joiner, slater, plasterer and plumber's work in erection of eight houses at Cononley, Yorks. Mr. Edward Smith, The Grange Farm, Carleton.

Cornelly.—June 29.—For alterations and additions to Pyle C.M. Chapel vestry, &c. Rev. T. R. Williams, the Chapel House, Cornelly.

Darenth.—July 6.—For erection of work-rooms at Darenth Asylum, Dartford, Kent. Mr. T. W. Aldwinckle, 20 Denman Street, London Bridge, S.E. Send 2*l.* deposit to the office of the Metropolitan Asylums Board, Embankment, E.C.

Devizes.—June 28.—For erection of new waiting rooms, footbridge, and verandahs at Devizes station, Wilts., for the Great Western Railway Co. The Engineer, Bristol Station.

Dipton.—June 27.—For the works required in erection and completion of business premises. Mr. Thomas E. Taylor, architect and surveyor, The Grove, Lanchester, and Front Street, Annfield Plain.

Dublin.—July 4.—For the construction and erection near the Goraghwood station of a timber-framed storage bin, &c., about 50 feet by 50 feet, and averaging about 35 feet high, with timber roof covered with corrugated iron. Also an engine and boiler house, &c., about 75 feet long by 36 feet wide, sides and roof to be steel-framed and covered with galvanised corrugated iron, for the Great Northern Railway Company of Ireland. Mr. F. A. Campion, chief engineer, Amiens Street Terminus, Dublin, or the District Engineer, Belfast.

Egremont.—For the extension of the Gasworks, for the Egremont Urban District Council. Contract No. 1: Excavations, concrete and masonry of retort house. Deposit 1*l.* 1*s.* Messrs. Thomas Newbigging & Son, engineers, 5 Norfolk Street, Manchester, or at the Gasworks, Egremont, Cumberland.

Ellesmere.—For building new shop premises, with storerooms, &c., at Ellesmere. The Ellesmere and District Cooperative Society, Ltd., Ellesmere.

Exeter.—For new offices, play-shed, fuel-store, and other work at the Episcopal schools, Mount Dinham. Mr. James Jerram, F.R.I.B.A., architect, 1 Bedford Circus, Exeter.

Folkestone.—July 2.—For erection of a temporary building at the County School for Girls. Mr. James Quick, local secretary, Technical Institute, Folkestone.

Footscray.—July 4.—For the enlargement of Langlands Council school at Footscray, Kent. Deposit 1*l.* Apply after June 13 to Mr. W. H. Robinson, M.S.A., architect to the Kent Education Committee, Caxton House, Westminster, S.W.

Garlands.—For the several works in one sum required in enlarging and remodelling the kitchen block at the Cumberland and Westmoreland Asylum, Garlands, near Carlisle. Mr. George Dale Oliver, F.R.I.B.A., county architect, Carlisle.

Glanton.—July 2.—For erection of a dwelling house at Glanton. Mr. M. Temple Wilson, M.R.S.I., architect and surveyor, Alnwick; or the Queen's Head Hotel, Glanton.

Ireland.—June 29.—For rebuilding premises in Bridge Street, Ardee. Mr. Peter Cahill, C.E., architect, Francis Street, Dundalk.

Keighley.—For the work required in erection of a bungalow at Thwaites Brow. Mr. David W. Weatherhead, architect and surveyor, Low Street, Keighley.

Kenilworth.—For proposed new parochial hall at Kenilworth. Mr. Harry Quick, architect, 35 Hertford Street, Coventry.

Keynsham.—June 28.—For the erection of a new goods shed at Keynsham, near Bristol. The Engineer, Great Western Railway Station, Bristol.

Knowle.—June 28.—For erection of a work-room block and sundry alterations at the County Lunatic Asylum, Knowle, Fareham, Hants. Deposit 6*l.* 6*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Leyton.—June 28.—For the construction of underground conveniences in High Road, Leytonstone. Mr. William Dawson, M.I.C.E., Town Hall, Leyton.

London.—June 28.—For the extension of the verandah covering over the goods platform at Acton Station, for the Great Western Railway Company. The Engineer, Paddington Station, London.

London.—June 28.—For building a boundary wall at the Home Park Depot, Lower Sydenham, for the Lewisham Borough Council. The Town Hall, Catford (Surveyor's Department).

London.—July 1.—For the construction of underground conveniences in Finsbury Park, by the Finsbury Gate, Seven Sisters' Road, for the Islington Borough Council. Send 2*l.* 2*s.* deposit after June 20 to Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street.

London.—July 5.—For certain plastering work in the "O and P" ward at the Sick Asylum, Devons Road, Bromley-by-Bow. The Engineer and Superintendent of Labour at the Asylum, Devons Road, Bromley-by-Bow.

London.—July 6.—For alterations and additions to certain staff buildings at South Wharf Smallpox Shelter, Rotherhithe, S.E., for the Metropolitan Asylums Board. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Office of the Board, Embankment, E.C.

London.—July 28.—For the construction of exit iron staircases and the necessary structural alterations in connection therewith at the St. George's Workhouse, Mint Street, Borough, S.E. Deposit 1*l.* 1*s.* Mr. A. J. Wade, architect, 104 Harvist Road, Brondesbury, N.W.

Maiden Law.—June 28.—For erection and completion of extra nurses' bedrooms at Maiden Law Sanatorium, Lanchester. Mr. George Thos. Wilson, architect, 22 Durham Road, Blackhill.

Maidstone.—July 5.—For the erection of offices, workshops, stores, &c., at Roger's Wharf, St. Peter's Street. Deposit 3*l.* 3*s.* The County Surveyor, West Borough Chambers, Maidstone.

Matlock.—July 8.—For certain alterations and additions to Smedley's Hydropathic, consisting of thirty-two bedrooms, &c. Tenders are invited for work connected with the following trades:—Mason, bricklayer, concretor, excavator and drainage, joiner, plasterer, plumber, glazier and painter. Apply after June 24 at the Secretary's Office, Smedley's Hydropathic, Matlock.

Metheringham Fen and Tanvats (Lincs).—June 30.—For alterations and additions to farm buildings and cottages at Metheringham Fen and Tanvats, for the small holdings committee of the Kesteven County Council. Mr. Jesse Clare, county architect, Sleaford.

Mexborough.—July 8.—For the following work, for the West Riding Education Committee, viz.: Mexborough new mixed and infants' school, and special subjects block (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

Nelson.—July 9.—For the various works required in connection with car shed extension. Mr. W. Shackleton, A.M.I.C.E., borough engineer and surveyor, Town Hall, Nelson.

New Malden.—June 30.—For erection of Church schools at Kingston Road. Messrs. Vincent Davison & Nicol, architects, Coombe Chambers, New Malden.

Newton Abbot.—June 28.—For erection of a new goods shed, &c., at Newton Abbot, Devonshire, for the Great Western Railway. The Engineer, North Road, Plymouth.

Nuneaton.—June 28.—For additions to the Free Library in Coton Road. Deposit 1*l.* 1*s.* Mr. F. C. Cook, borough surveyor, Council Offices, Nuneaton.

Portsmouth.—June 27.—For erection, completion, and maintenance in thorough repair for six calendar months of a chapel, house, offices, boundary walls and fences in the new cemetery at Milton. Deposit 3*l.* 3*s.* The Borough Engineer's Offices, Town Hall, Portsmouth.

Rochdale.—June 29.—For erection of a boundary wall and fence at the workhouse, Dearnley. Mr. Shuttleworth, architect and surveyor, Littleborough.

Romford.—For erection of new business premises and dwelling house, with works incidental thereto, on the site of the Old Windmill and Bells, Market Place. Send names to Mr. E. J. Little, architect, Hornchurch Road, Romford, or to Mr. C. E. Pease, F.S.I., surveyor, 16 Clifford's Inn, Fleet Street, E.C.

Romford.—June 30.—For erection of a Council school and mentally defective centre. Send names with a deposit of 2*l.* 2*s.* by June 30 to Mr. A. S. R. Ley, architect, 54 and 55 Bishopsgate Street Without, London, E.C.

Salford.—June 27.—For supply and erection of a timber stores at the Central Car Depôt, Frederick Road, Pendleton. The General Manager, Tramways Department, 32 Blackfriars Street, Salford.

Saltburn.—June 25.—For erection of a secondary school at Saltburn for about 120 girls, for the North Riding County Council. Apply by June 25 to Mr. J. C. Wrigley, Education Department, County Hall, Northallerton.

Sandsend (Yorks.).—June 30.—For the works in connection with the stonework for rebuilding East Row Bridge, near Sandsend, in the Whitby Rural District, for the North Riding County Council. The County Surveyor's office, County Hall, Northallerton.

Scotland.—For building a brick hall, suitable for a reading room, in Birgham. The Schoolhouse, Birgham, Berwickshire.

Sennen.—July 1.—For additions and alterations to buildings at St. Aubyn's, Trevilly, Sennen, Cornwall. The Steward, Chyaneglos, Marazion.

Settle.—June 28.—For alterations and additions at the works of the Settle Gas Co., Ltd. The Company's office, Church Street, Settle.

Shelf.—June 27.—For the carpenter and joiner, plumber and glazier, slater and plasterer work and materials required in alterations and additions to the Variety Club, Stone Chair, Shelf, near Halifax. Mr. G. Reginald Oddy, architect, Northowram, Halifax.

Southend-on-Sea.—July 7.—For the construction of the Southchurch Esplanade extension. Approximately 1,260 feet in length, 69 feet in width, together with an apron wall. Deposit 5*l.* 5*s.* Mr. Ernest J. Elford, M.I.M.E., borough engineer, Municipal Buildings, Southend-on-Sea.

Southend-on-Sea.—July 4.—For alterations and additions to Leigh Road and Brewery Road Council schools. Deposit 1*l.* 1*s.* Mr. Ernest J. Elford, C.E., borough engineer and surveyor, Municipal Buildings.

Treviscoe (Cornwall).—July 2.—For proposed Wesleyan Methodist church, near St. Stephen's, Grampound Road, Treviscoe. Mr. Sampson Hill, architect, Green Lane, Redruth.

Wales.—For erection of a house at Kidwelly. The Castle School House, Kidwelly, Carmarthenshire.

Wales.—June 27.—For erection by one contract of eleven covered playsheds at the Merthyr Tydfil Council schools at Pengarnddu, Penyrheolgerrig, Caedraw, Abercanaid, Troedyrhiw, Aberfan, Edwardsville, and Woodlands, for the education committee. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—June 27.—For erection of an additional pavilion, together with other work, at the Mardy Isolation Hospital, Merthyr Tydfil. Deposit 2*l.* 2*s.* The Borough Engineer, Merthyr Tydfil.

Wales.—June 27.—For work to be done and materials used in making alterations and additions for the conversion of Cyfarthfa Castle into a secondary school, and the erection of science laboratories, art and lecture rooms, with latrines, playgrounds and other works in connection therewith, for the Corporation of Merthyr Tydfil. Deposit 5*l.* 5*s.* Mr. T. F. Harvey, M.I.C.E., borough engineer, Merthyr Tydfil.

Wales.—June 27.—For erection of two semi-detached houses of design A, also two semi-detached houses of design B, near the Thomastown Park, Merthyr. Mr. R. Morris, architect, Idrisville, Queen's Road, Merthyr.

Wales.—June 27.—For carrying out extensive alterations at Church Road, Ton Petre, for the Ton Co-operative Industrial Society, Ltd. Send 2*l.* 2*s.* deposit by June 27 to Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre, Rhondda.

Wales.—June 27.—For erection and completion of sixteen semi-detached houses, with roads, sewers, &c., for the Park Crescent Building Club, near Thomas Town Park, Merthyr Tydfil. Mr. Rees Morris, architect, Idrisville, Queen's Road, Merthyr Tydfil.

Wales.—June 29.—For erection of two cottages at their Cottage Homes, Church Village, Llanwit Fardre, for the Guardians of Pontypridd Union. Deposit 1*l.* 1*s.* Mr. John Richards, clerk of the works, The Homes, Llwynypia.

Wales.—June 29.—For building new schools for the Trustees of the St. John's schools, Cardiff. Mr. E. W. M. Corbett, architect, Castle Street, Cardiff.

Wales.—June 30.—For erection of shop premises at Brecon Road, Merthyr Tydfil. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—June 30.—For erection of two shop premises at Aberfan. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—June 30.—For building twenty-five officials' houses at Bedwas, for the Bedwas Building Co., Ltd. Mr. Geo. Kenshole, M.S.A., Station Road, Bargoed.

Wales.—July 1.—For erection of two villas at Cemetery Road, Porth. Mr. James T. Jenkins, architect and surveyor, Porth and Bedwas.

Wales.—July 14.—For erection of a Council school building at Goodwick, Pembrokeshire. Deposit 1*l.* 1*s.* Captain Phillips, "Stop-and-Call," Goodwick, and also Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

Weymouth.—June 27.—For annual repairs and renovations at the various elementary schools in the Borough. The Borough Surveyor, Municipal Buildings.

Whiston.—July 7.—For repairs and alterations at Cumber Lane Farm House and Buildings, Whiston, Prescot, Lancs. Deposit 10*s.* Mr. James Gandy, architect, Masonic buildings, St. Helen's.

Woking.—July 5.—For erection of a new sorting office at Woking, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Postmaster, Woking, and H.M. Office of Works, Storey's Gate, London, S.W.

Worcester.—June 24.—For rebuilding in brickwork of Kenswick Bridge, on the main road between Worcester and Martley. Deposit 1*l.* 1*s.* Mr. J. H. Garrett, surveyor of county bridges, Shire Hall, Worcester.

Worth.—July 2.—For the execution of summer repairs at Worth Council school. Mr. Wilfrid H. Robinson, architect, Caxton House, Westminster, or Admiral F. G. Stopford, correspondent, Worth, Kent.

West Bromwich.—For the erection of new schools in High Street and Coles Lane, Hill Top. Deposit 2*l.* 2*s.* Messrs. Wood & Kendrick, architects, High Street, West Bromwich.

Yorkshire.—June 29.—For the following works, for the education committee of the East Riding, viz.:—(*a*) For alterations and additions to the Council school at Atwick. Deposit 1*l.* 1*s.* (*b*) Erection of new cloak-rooms and formation of yards, &c., at the Council school at Holmpton. (*c*) Erection of new cloak-room and heating chambers, &c., at the Council school at Hutton Cranswick. The Building Surveyor, County Hall, Beverley.

# TENDERS.

## ARNSIDE.

For additional buildings, Inglemere girls' school. Mr. R. BRADLEY BARKER, architect and surveyor, Arnside.

*Accepted tenders.*

Simpson, Kendal.
Steel & Co., Kendal.
Wilman, Morecambe.
Wilson, Lancaster.
Higginbotham & Sons, Bradford.
Total 1,889*l.* 3*s.* 4*d.*

## BRIDPORT.

For the erection of a house at Bridport. Messrs. CRICKMAY & SONS, architects and surveyors, 13 Victoria Street, Westminster, and Weymouth.

| | | | |
|---|---|---|---|
| Green | £3,360 | 0 | 0 |
| Cooper | 3,245 | 0 | 0 |
| Jenkins & Sons | 3,123 | 0 | 0 |
| Wort & Way | 3,099 | 10 | 0 |
| Trask & Sons | 3,018 | 0 | 0 |
| WAKEHAM BROS., Plymouth (*accepted*) | 2,895 | 0 | 0 |

## CARLISLE.

For the extension of buildings at the Central Electric Lighting Station in James Street. Mr. HENRY C. MARKS, M.I.C.E., city engineer and surveyor.

| | | | |
|---|---|---|---|
| Baty | £2,697 | 0 | 0 |
| Reed & Sons | 2,660 | 0 | 0 |
| Logan | 2,655 | 0 | 0 |
| Martin | 2,549 | 0 | 0 |
| J. & R. Bell | 2,380 | 0 | 0 |
| Musgrove | 2,355 | 0 | 0 |
| LAING & SON (*accepted*) | 2,304 | 0 | 0 |
| Engineer's estimate | 2,300 | 0 | 0 |

## CLAYTON.

For the erection of new phthisis block at the Union Workhouse, for North Bierley Union. Mr. J. HARPER BAKES, architect, Leeds.

*Accepted tenders.*

| | | | |
|---|---|---|---|
| Illingworth, Idle, Bradford, superstructure | £388 | 0 | 0 |
| Balmforth & Sons, Queensbury, mason, &c. | 279 | 0 | 0 |
| Walton, Clayton, plumber | 197 | 0 | 0 |
| Crabtree & Berry, Bradford, plasterer | 173 | 0 | 0 |
| Smithies, Bradford, roof tiler | 59 | 10 | 0 |

## COVENTRY.

For rebuilding business premises, Cross Cheaping. Mr. F. FOSTER, architect, Coventry.

| | | | |
|---|---|---|---|
| Worwood | £1,550 | 0 | 0 |
| Orr Bros. | 1,466 | 3 | 4 |
| W. & J. Webb | 1,450 | 0 | 0 |
| Wincott | 1,420 | 0 | 0 |
| Exor. of Garlick | 1,416 | 0 | 0 |
| Smith | 1,414 | 0 | 0 |
| Kelley & Son | 1,365 | 18 | 4 |
| Harris | 1,357 | 0 | 0 |
| Lord | 1,327 | 0 | 0 |
| RANDLE, Coventry (*accepted*) | 1,265 | 0 | 0 |

For erection of a public elementary school to accommodate 1,254 children, at Mile Lane. Mr. F. FOSTER, surveyor, Little Park Street, Coventry.

| | | | |
|---|---|---|---|
| W. & J. Webb | £19,321 | 0 | 0 |
| Higgs | 18,881 | 8 | 0 |
| Dallow & Sons | 18,564 | 0 | 0 |
| Kelley & Son | 18,323 | 1 | 4 |
| Wincott | 18,316 | 0 | 0 |
| Smith & Sons | 18,200 | 0 | 0 |
| Randle | 18,000 | 0 | 0 |
| Smith & Co. | 17,997 | 0 | 0 |
| Lord | 17,400 | 0 | 0 |
| Hickman | 17,309 | 0 | 0 |
| Adams & Son | 17,304 | 9 | 0 |
| Harris | 17,197 | 0 | 0 |
| Gibbs | 17,071 | 0 | 0 |
| Moss & Sons | 17,000 | 0 | 0 |
| EXOR. OF GARLICK, Coventry (*accepted*) | 16,850 | 0 | 0 |

## ELLESMERE PORT.

For the construction of Whitby Road. Mr. J. M. HUDSON, surveyor, Ellesmere Port, near Chester.

| | | | |
|---|---|---|---|
| Hutton & Co. | £3,109 | 15 | 1 |
| Balmer | 2,565 | 4 | 4 |
| Bennie & Thompson | 2,515 | 5 | 9 |
| Law | 2,345 | 0 | 0 |
| WARREN, Seacombe (*accepted*) | 1,835 | 13 | 8 |

## IRELAND.

For building fifteen cottages at Dean's Grange, Co. Dublin, for the Rathdown Rural District Council.

No. 1, Dowling, Kingstown, 148*l.* 10*s.*; 147*l.* 10*s.* in pairs (*accepted*); No. 2, James Lawlor, Blackrock, 148*l.* 17*s.*, in pairs; No. 3, L. Monks, Glenageary, 150*l.*, in pairs; No. 4, H. Pemberton, Ballybrack, 159*l.* 10*s.*, in pairs.

## LONDON.

For the construction of an underground convenience in Barking Alley, Byward Street, for the Corporation.

| | | | |
|---|---|---|---|
| Doulton & Co. | £1,810 | 0 | 0 |
| Jennings | 1,750 | 0 | 0 |
| Greenwood | 1,733 | 0 | 0 |
| Ford & Walton | 1,700 | 0 | 0 |
| Davis, Bennett & Co. | 1,700 | 0 | 0 |
| Lawrence & Sons | 1,592 | 0 | 0 |
| ROBERTS & Co. (*accepted*) | 1,536 | 0 | 0 |

For repainting the stairway to Charing Cross footbridge, the seats and railings on the Victoria Embankment, the lamps, seats and railings on the Chelsea and Albert Embankments, Lambeth Bridge (partial), Rotherhithe Tunnel (bridge over East London Railway), and Bow Bridge, for the London County Council.

| | | | |
|---|---|---|---|
| Inns | £515 | 11 | 8 |
| Proctor & Sons | 498 | 11 | 4 |
| Dudley | 493 | 5 | 0 |
| Woollaston & Co., Limehouse (*recommended*) | 328 | 15 | 6 |
| Chief engineer's estimate | 500 | 0 | 0 |

For the repaving with wood blocks of a portion of the carriageway of the Victoria Embankment near Blackfriars Bridge, for the London County Council.

| | | | |
|---|---|---|---|
| The Improved Wood Pavement Co., Queen | | | |
| Griffiths & Co. | £945 | 0 | 8 |
| Chief engineer's estimate | 900 | 0 | 0 |
| Mowlem & Co. | 895 | 0 | 0 |
| The Acme Flooring and Paving Co. (1904) | 823 | 12 | 5 |
| Victoria Street (*recommended*) | 718 | 3 | 0 |

For the construction of a bridge over the waterworks branch of the river Lee, at Hackney Marsh, for the London County Council.

| | | | |
|---|---|---|---|
| Dick, Kerr & Co. | £3,688 | 4 | 3 |
| Kirk & Randall | 3,476 | 0 | 0 |
| Rowlingsons & Co. | 3,364 | 13 | 9 |
| Orr, Watt & Co. | 3,280 | 16 | 6 |
| Perry & Co. | 3,253 | 0 | 0 |
| Head, Wrightson & Co. | 3,252 | 5 | 3 |
| Grounds & Newton | 3,188 | 15 | 6 |
| Brebner & Co. | 3,160 | 0 | 0 |
| Pedrette | 3,153 | 9 | 6 |
| Muirhead & Co. | 3,031 | 17 | 3 |
| Dickson | 2,972 | 9 | 6 |
| Thorne & Sons | 2,950 | 1 | 4 |
| Manders | 2,912 | 14 | 0 |
| Jackson | 2,898 | 3 | 10 |

For the making-up and paving of that part of Becmead Avenue, Streatham, which is not already a parish road, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

| | | | |
|---|---|---|---|
| Adams | £978 | 0 | 0 |
| Parry & Co. | 945 | 0 | 0 |
| Trueman | 925 | 0 | 0 |
| Mowlem & Co. | 912 | 0 | 0 |
| E. & E. Iles | 891 | 12 | 0 |
| Bailey & Weller (*recommended*) | 850 | 0 | 0 |

## MALDON.

For the rebuilding of shops Nos. 122, 124 and 126 High Street, for Mr. Wm. C. Firmin. Mr. J. RUSSELL ROGERS, P.A.S.I., architect, Maldon.

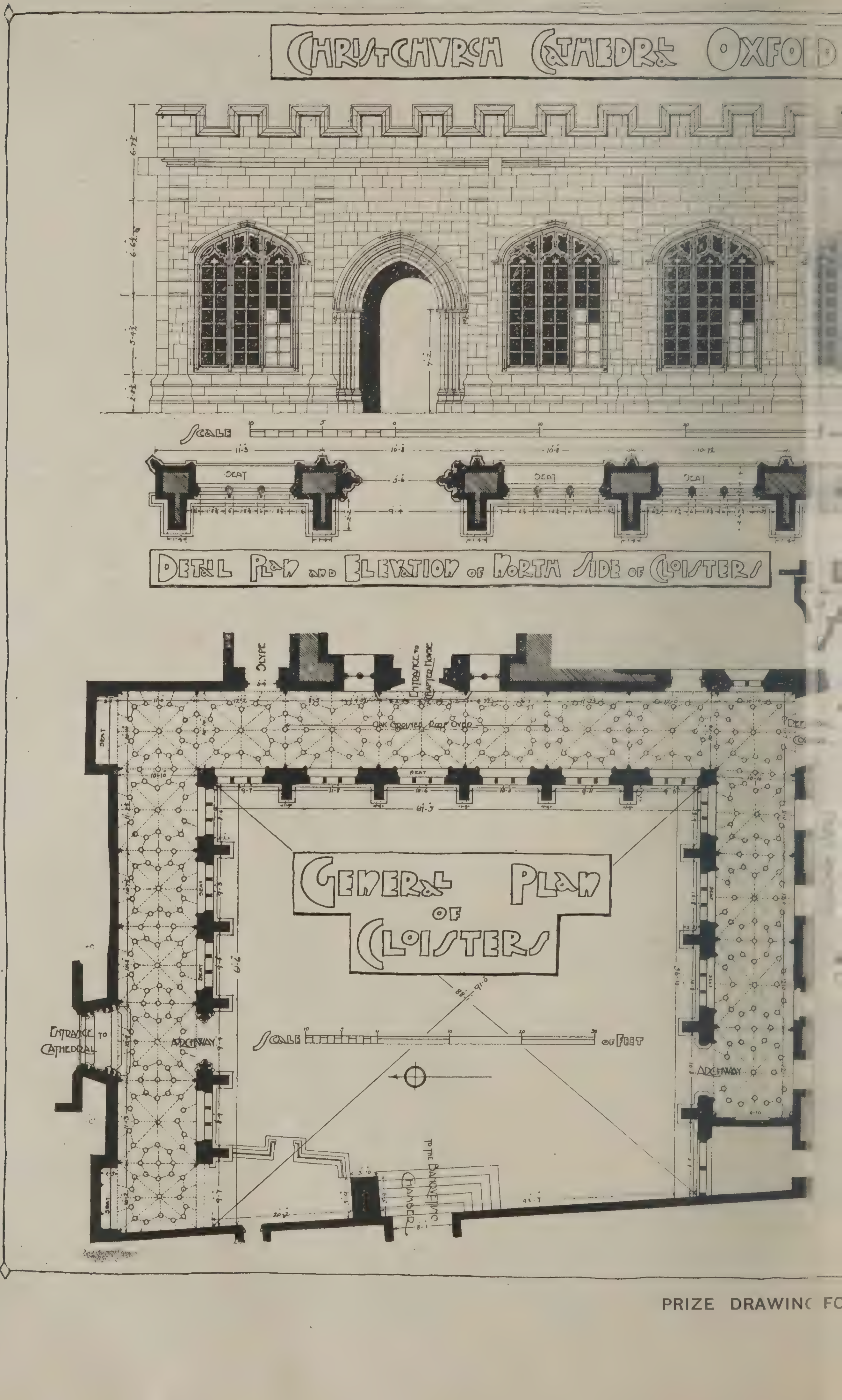
| | | | |
|---|---|---|---|
| Baxter | £1,385 | 0 | 0 |
| Rayner | 1,285 | 0 | 0 |
| Grimwood & Sons | 1,098 | 0 | 0 |
| F. & A. SHERLING (*accepted*) | 998 | 0 | 0 |

## NEWARK.

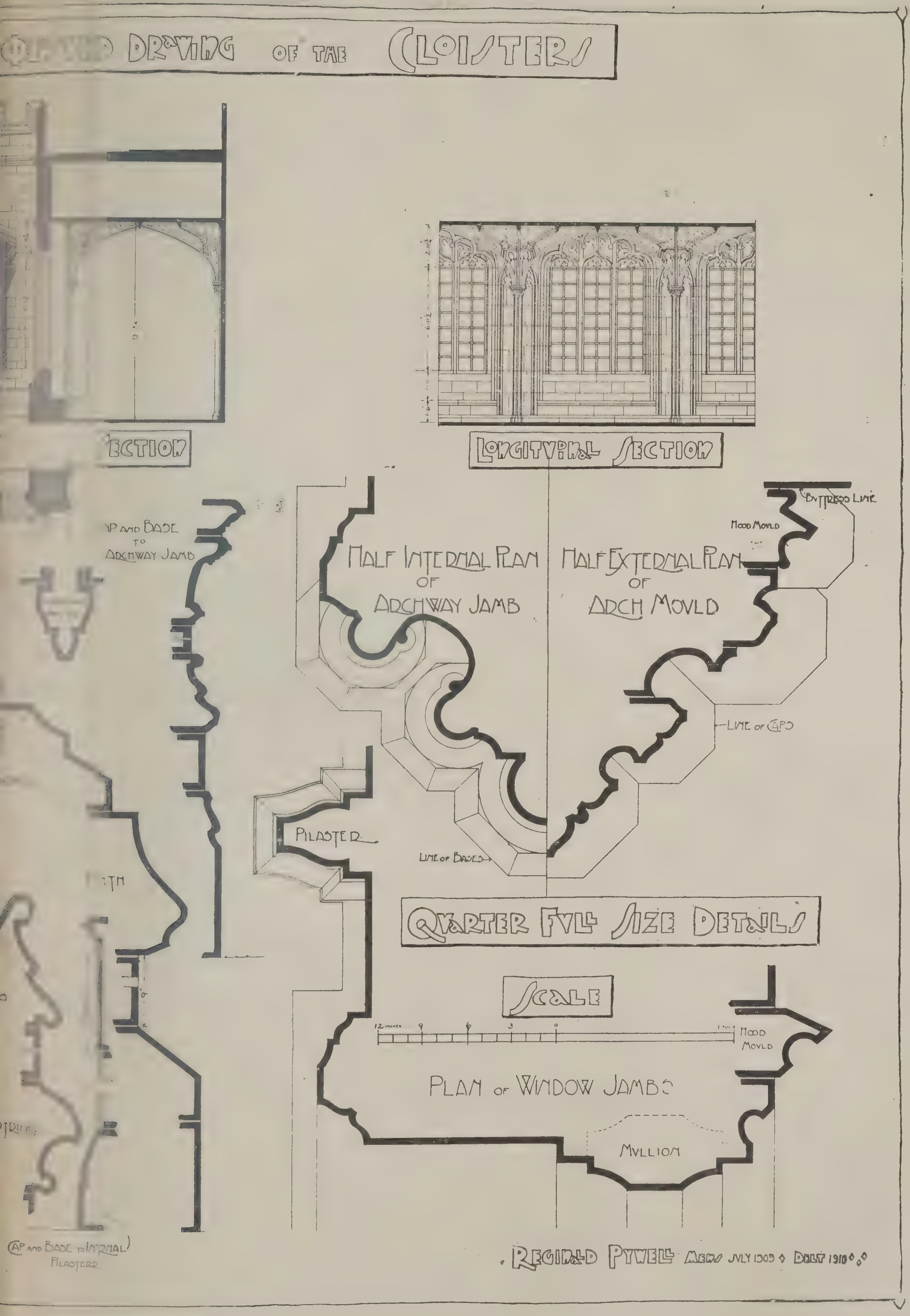
For the erection of five almshouses for the Trustees of St. Leonard's Hospital. Messrs. SHEPPARD & LOCKTON, architects, Bargate, Newark.

| | | | |
|---|---|---|---|
| Wand | £850 | 5 | 0 |
| Wadsworth & Son | 849 | 15 | 0 |
| Brown & Son | 847 | 0 | 0 |
| Baines | 835 | 0 | 0 |
| Dobney | 817 | 10 | 0 |
| Renshaw | 815 | 17 | 0 |
| SMITH, Newark (*accepted*) | 775 | 0 | 0 |

## "THE ARCHITECT" STUDENTS'


CHRISTCHURCH CATHEDRAL OXFO
SCALE
SEAT
DETAIL PLAN AND ELEVATION OF NORTH SIDE OF CLOISTERS
SLYPE
ENTRANCE TO CHAPTER HOUSE
OAK GROINED ROOF OVER
GENERAL PLAN OF CLOISTERS
ENTRANCE TO CATHEDRAL
ARCHWAY
SCALE OF FEET
TO THE BANQUETING CHAMBER

PRIZE DRAWIN FO


DRAWING OF THE CLOISTERS
ECTION
LONGITUDINAL SECTION
P AND BASE TO ARCHWAY JAMB
HALF INTERNAL PLAN OF ARCHWAY JAMB
HALF EXTERNAL PLAN OF ARCH MOULD
BUTTRESS LINE
HOOD MOULD
LINE OF CAPS
PILASTER
LINE OF BASES
TH
QUARTER FULL SIZE DETAILS
SCALE
12 INCHES 9 6 3 0 1 FOOT
HOOD MOULD
PLAN OF WINDOW JAMBS
MULLION
TRING
CAP AND BASE TO INTERNAL PILASTERS
REGINALD PYWELL MENS JULY 1909 ◇ DELT 1910

MAY.—By Mr. Reginald Pywell.

## RIPLEY.

For sewerage and sewage disposal works at Strut Lane. Mr. G. W. BIRD, surveyor, Town Hall, Ripley, Derby.

| | | | |
|---|---|---|---|
| Winser | £950 | 7 | 4 |
| Hyslop | 885 | 2 | 1 |
| Vickers | 883 | 4 | 0 |
| Bell & Sons | 850 | 0 | 0 |
| Jewell | 849 | 0 | 0 |
| Atkinson & Co. | 832 | 15 | 6 |
| Ward & Tetley | 774 | 2 | 8 |
| Beighton | 745 | 15 | 9 |
| Auld | 646 | 0 | 0 |
| NORMAN, Marehay, Derby (*accepted conditionally*) | 629 | 0 | 0 |

## WIGSTON MAGNA.

For works of sewerage, Wigston Magna, near Leicester. Messrs. EVERARD, SON & PICK, engineers, Leicester.

*Sewers, pumping station, and outfall works.*

| | | | |
|---|---|---|---|
| Lawson & Son | £19,600 | 0 | 0 |
| Hayes & Sons | 16,585 | 14 | 0 |
| Watson | 15,469 | 7 | 0 |
| Crawford | 14,604 | 5 | 4 |
| Gimson | 14,482 | 1 | 9 |
| Dix & Co. | 13,996 | 13 | 7 |
| British Construction Co. | 13,935 | 0 | 0 |
| Nowell & Sons | 13,322 | 2 | 0 |
| Pedrette | 12,951 | 8 | 8 |
| Clift | 12,519 | 7 | 0 |
| Chapman | 11,885 | 8 | 10 |
| Johnson & Langley | 11,851 | 0 | 0 |
| Chamberlain | 11,790 | 2 | 6 |
| Lane Bros. | 11,331 | 2 | 8 |
| Wright & Co. | 11,243 | 15 | 5 |
| Higgins | 11,099 | 11 | 6 |
| Palmer | 10,829 | 6 | 4 |
| BELL & SONS, Tottenham (*accepted*) | 10,698 | 0 | 0 |

*Cast-iron pipes.*

| | | | |
|---|---|---|---|
| Oakes & Co. | 1,255 | 17 | 9 |
| Cochrane & Co. | 1,251 | 4 | 0 |
| Sheepbridge Coal and Iron Co. | 1,245 | 15 | 6 |
| Butterley Iron Works | 1,243 | 9 | 8 |
| Holwell Iron Co. | 1,241 | 2 | 0 |
| Clay Cross Co. | 1,236 | 8 | 4 |
| Staveley Iron and Coal Co. | 1,232 | 15 | 8 |
| E. C. & J. Keay | 1,200 | 9 | 1 |
| STANTON IRONWORKS Co., Nottingham (*accepted*) | 1,178 | 0 | 0 |

*Sewage ironwork.*

| | | | |
|---|---|---|---|
| Whitehead & Poole | 939 | 0 | 9 |
| Glenfield & Kennedy | 927 | 18 | 0 |
| Carlton Engineering Co. | 926 | 16 | 2 |
| Lees & Sons | 912 | 4 | 6 |
| Ames Crosta Sanitary Engineering Co. | 879 | 12 | 11 |
| Adams's Hydraulics | 830 | 0 | 6 |
| Farrer | 809 | 17 | 9 |
| Wolstenholme & Son | 763 | 1 | 4 |
| Gimson & Co. | 714 | 4 | 0 |
| Blakeborough & Sons | 703 | 5 | 0 |
| Ham, Baker & Co. | 679 | 19 | 4 |
| Jennings | 663 | 0 | 2 |
| RUSSELL & SONS, Syston (*accepted*) | 632 | 10 | 0 |

*Gas-engines, suction gas plants, and pumps.*

| | | | |
|---|---|---|---|
| Priddle | 2,206 | 12 | 4 |
| Schofield & Mitchell | 1,977 | 0 | 6 |
| Crossley Bros. | 1,970 | 0 | 0 |
| Glenfield & Kennedy | 1,950 | 11 | 11 |
| Whitehead & Poole | 1,864 | 5 | 0 |
| Hayward, Tyler & Co. | 1,863 | 18 | 0 |
| Pratchett Bros. | 1,799 | 2 | 6 |
| Ruston, Proctor & Co. | 1,769 | 10 | 1 |
| Waller & Son | 1,758 | 6 | 6 |
| Mather & Son | 1,739 | 19 | 3 |
| Campbell Gas-engine Co. | 1,709 | 18 | 0 |
| Death & Ellwood | 1,705 | 18 | 0 |
| Davey, Paxman & Co. | 1,502 | 10 | 0 |
| Gimson & Co. | 1,481 | 12 | 0 |
| Wolstenholme & Son | 1,424 | 16 | 0 |
| TEASDALE BROS., Darlington (*accepted*) | 1,393 | 10 | 0 |
| Bird & Co. | 1,373 | 14 | 6 |

## WALES.

For the erection of workmen's cottages at Coldbrook, Abergavenny. Mr. W. J. PRICHARD, architect, Abergavenny.

| | | | |
|---|---|---|---|
| King & Co. | £1,723 | 0 | 0 |
| Moon | 1,677 | 0 | 0 |
| Reed | 1,618 | 0 | 0 |
| FOSTER & HILL, Abergavenny (*accepted*) | 1,530 | 0 | 0 |

For erection of a Council school for mixed and infants at Ty'r Graig, Aberbeeg, for the Abertillery education committee. Messrs. SPEIR & BEAVAN, architects, Cardiff.

| | | | |
|---|---|---|---|
| Shail | £14,800 | 0 | 0 |
| Lewis | 14,400 | 0 | 0 |
| Howells | 14,004 | 10 | 0 |
| Turner & Sons | 13,924 | 0 | 0 |
| Davies & Sons | 13,878 | 0 | 0 |
| Thomas | 13,870 | 12 | 2 |
| Jenkins | 13,570 | 0 | 0 |
| DAVIES & HOWELL, Cardiff (*accepted*) | 13,469 | 0 | 0 |

## POMPEII AND ITS FALL.

"THE Fall of Pompeii," now being reproduced in the spacious and beautiful grounds of the Crystal Palace, is based on Lord Lytton's well-known work. Five hundred and fifty performers are taking part in the spectacle, besides a number of horses, camels and elephants. The scene is laid in the public place or forum of Pompeii, to the left and right of which stretch other buildings and portions of the city reproduced from the records and plans of the excavations made. Messrs. Pain have given careful attention to the reproduction of the architecture, costumes and ceremonies of the great city of Pompeii. The magnificent picture is 500 feet in length and 80 in depth, the huge stage being 350 feet by 50 feet. The spectacle is divided into three parts and includes many novel and exciting features. The music has been specially written for the occasion, and the whole of the ground is lit up by powerful arc lamps and controlled by Pain's electrical contrivances.

## CLOISTERS TO CHRIST CHURCH CATHEDRAL, OXFORD.

THESE cloisters were constructed to connect the refectory with the chapter-house and cathedral, and some twelfth-century buildings which were in the way were removed to make way for them. The foundations of these buildings, however, were left, and are still under the cloister close. The cloisters were erected about the end of the fifteenth and beginning of the sixteenth century, and are to the south of the cathedral. They are reached by the public from the staircase hall of the banqueting chamber.

Sir Gilbert Scott, in 1870, while restoring the cathedral, also restored the archway and window to the left of it in the detail elevation.

The chapter-house which is situate on the east side of the cloisters, is of a somewhat unusual shape, being a rectangle on plan. It is in the Early English style, with a fine five-light window at one end, and a vaulted roof. Underneath the window is the stone let in the wall by Wolsey, taken from Ipswich when Wolsey removed Cardinal's College from that town to Oxford. The entrance Norman doorway from the cloisters is a good and ornate example, and has a small window on either side, each being divided into two lights by a small shaft with cap and base.

The stone employed in building the cloisters, like the rest of the buildings in Oxford, has weathered very badly, and is crumbling away in every direction.

THE Rev. Selwyn Image has been elected Slade Professor of Fine Art, in succession to Mr. C. Holmes, who recently resigned the position upon his appointment as director, keeper, and secretary of the National Portrait Gallery.

MR. T. M. CAPPON, F.R.I.B.A., Dundee, has been selected by the St. Andrew's Provincial Committee for the Training of Teachers to prepare plans for a new training college and demonstration school. A site has been purchased for 13,700*l.* in Park Place, Dundee, near University College, and possession of it will be obtained in May, 1911. The buildings will cost over 40,000*l.* At a meeting of the committee on the 17th inst. a proposal that a competition should be organised was withdrawn after discussion.

## THE INCORPORATED CHURCH BUILDING SOCIETY.

The Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels held its usual monthly meeting on the 16th inst., at the Society's House, 7 Dean's Yard, Westminster Abbey, S.W., Lieut.-Col. the Hon. G. H. W. Windsor Clive in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Caversham, St. Andrew, Oxford, 150*l.*; Coventry, St. Margaret, 200*l.*; and East Cowton, All Saints, near Northallerton, 70*l.* Rebuilding the churches of Lydgate, St. Anne, near Manchester, 50*l.*; Taplow, St. Nicholas, Bucks, 120*l.*; and The Bourne, St. Thomas, Surrey, 50*l.* Towards enlarging or otherwise improving the accommodation in the churches at Barton Hill, St. Luke, near Bristol, 25*l.*; Llandrindod Wells, Holy Trinity, 50*l.*; Llanelly, St. Elli, Breconshire, 40*l.*; Penrieth, St. Christiolus, Pembrokeshire, 25*l.*; Wittersham, St. John the Baptist, Kent, 25*l.*; and Slade Green, St. Augustine, Kent, 100*l.* A grant of 10*l.*, making in all 45*l.*, was also made from the Special Mission Buildings Fund towards enlarging the Mission Church of the Good Shepherd, New Charlton, Kent. The following grants were also paid for works completed:—Llanbabo, St. Pabo, Anglesey, 25*l.*; St. Albans, St. Paul, 200*l.*; Dover, St. Barnabas, 30*l.*; Uplands, All Saints, Glos., 150*l.*; Whatcote, St. Peter, Worcester, 15*l.*; Eastleigh, All Saints, Hants, 200*l.*; Milton, St. Cuthbert, near Portsmouth, 20*l.*; Holloway, St. Padarn, Middlesex, 50*l.*; and Washford, St. Mary the Virgin, Devon, 30*l.* In addition to this the sum of 130*l.* was paid towards the repairs of ten churches from trust funds held by the Society. The grants voted at this meeting have nearly exhausted the funds at the disposal of the committee, and an earnest appeal is made for liberal subscriptions and donations from Church people to enable the committee to meet more adequately the many pressing applications for aid which are being continually brought before them.

## SANITARY ASSURANCE ASSOCIATION.

The twenty-ninth annual meeting of the Sanitary Assurance Association was held on June 10, when the annual report was adopted, and Mr. Walter Butler, M.Inst.C.E., re-elected president. Reference was made to the late Professor George Aitchison, a member of the original Executive Council of the Association, whose death was recorded with regret. Up to his death Professor Aitchison remained a member of the Honorary Council. The Association has accepted an invitation to be represented at the International Congress of Social Insurances to be held at The Hague in September next.

The annual report concludes with the following retrospect:—The advance made by science generally during the past half-century has been nowhere more thorough and manifest than in the domain of sanitation and hygiene. It is not easy to exaggerate the deplorable state of things that existed even twenty-nine years ago when the Sanitary Assurance Association was founded. Some of the arrangements then accepted were so far removed from what obtains to-day—even where the highest standard is not attainable—that it is hard to credit some of the early reports on property surveyed by the Association. It is not too much to say that the Association has been largely instrumental in raising the standard of sanitation to that which fortunately to so great an extent now holds good in all classes of buildings. At the time the Association was founded hardly any standard was recognised and the most primitive methods of sanitation were too often thought adequate. That there was then urgent need for reform in the matters most intimately affecting the amenities of home-life and the health of the individual was very evident. Even with all the advance that has been or will be made, constant vigilance will always be necessary for the maintenance of health, and the Association will continue to enforce the fundamental principles it was founded to maintain, and urge upon everyone the importance of sanitary efficiency, whether in the home, or in the buildings only occupied during working hours.

Messrs. Wallis & Smith, of Basingstoke, have been appointed consulting architects to the Basingstoke Board of Guardians.

The Standard Music Hall, opposite Victoria Station, Westminster, is to be entirely rebuilt; there will be seating accommodation for 2,500 to 3,000 people.

The "Paris in London" scheme, at a cost of about 750,000*l.*, is to be proceeded with. Mr. Ernest Gerard, of Piccadilly, W., is the architect.

## TRADE NOTES.

The Birtley Literary Society have given instructions to Messrs. Wm. Potts & Sons, Ltd., clock manufacturers, Leeds and Newcastle-on-Tyne, to erect a new public clock with two external dials at the Birtley Institute, at an early date.

Messrs. Sterlings, Ltd., boot and shoe manufacturers, Chesterfield, Derbyshire, have given instructions to Messrs. William Potts & Sons, Ltd., to erect a clock on their new premises, Chesterfield, Derbyshire, which is now in hand.

A new cork flooring has been invented and patented by Mr. F. W. A. Gruen, of 154, 155, and 156 Finsbury Pavement, E.C., who claims that the material is proof against fire, vermin, rot, and damp, will not crack or blister under any conditions, and is sound deadening. The colour is said to be everlasting, and the variety of designs endless. It has been used extensively in Germany, 30,000 yards alone having been laid at Messrs. Krupp's Works, at Essen. This should in itself prove a very good test.

Messrs. R. Waygood & Co., Ltd., held the tenth ordinary general meeting on the 16th inst. The report states that more work has been done than before, though owing to unprecedented competition the profits are slightly reduced. However, a further dividend was declared at the rate of 7 per cent. per annum for the six months ending December 31, 1909, making, with the interim dividend already paid, 6 per cent. for the year on the Ordinary shares. The Directors are considering plans for the rearrangement and enlargement of the factories as well as the introduction of up-to-date tools.

Our attention has been called to a new patent reinforced concrete tile which will no doubt be largely adopted. One of our principal contracting firms has predicted a prosperous career for it, and is prepared to adopt them. A syndicate is being formed to work the patent, with a view to placing it upon the market. The tiles are made under 40 tons pressure shield shape, and of Broseley thickness. No nailing is required, and they are claimed to be absolutely rainproof. The weight is 5 cwt. per square, and they can be made to any colour. The tile will be known as the I.D.L., the initials standing for impervious, durable, and light. From what we have seen of this new tile we think that the claims of the patentees should be in every way verified.

Our capricious climate has long been the remark of the visitor from less severe or more equable climates. And yet there was a time when England was called "merrie," and the seasons came and went at their expected times. Fifty years ago, if tradition is to be trusted, you could rely upon snow on New Year's Day, primroses in April, roses in June, strawberries in July, and pears in October. Of late years, however, the seasons in Britain appear to have changed their order. You may, perhaps, walk about comfortably without an overcoat at Christmas, where not infrequently the last week in May brings a snowstorm. All sorts of reasons are advanced for these changes. Some astronomers say the earth has altered her angle to the sun. Others blame the Gulf Stream. We are not concerned with the reasons, our business is to meet the circumstances and to bring solid comfort into the home, no matter what the weather without. The fact is obvious that even in the height of summer we may get raw mornings, damp afternoons, and chilly evenings. The thought of lighting a coal or wood fire conjures up a sort of curious feeling that we are contemplating something wrong, violating a household rule, or ignoring the tradition that summer is not the time for a fire. There is the inconvenience of laying a fire, which the servant often accomplishes in a half-hearted way that is enough to deter a sensitive housewife from ordering a fire at all. Maybe the grate is decorated with flowers or some other form of ornament which has to be removed. The gas fire is the solution of the whole difficulty. Turn on the tap, apply a match, and in a few minutes the room is cosy; just at the right heat which you can regulate exactly to your requirements.

The Rawtenstall Corporation have instructed the Town Clerk to make application to the Local Government Board for sanction to borrow a further sum of 11,000*l.* for electricity purposes.

The Council of the London Master Builders' Association last week considered the Bill to amend the law relating to Trade Unions now before Parliament. As the Bill proposes that the funds of the Trade Unions, which have been subscribed solely for trade purposes, shall be utilised to contribute to the expenses of some Members of Parliament, the Council decided to protest against the Bill.

## VARIETIES.

SIR WILLIAM QUILLER ORCHARDSON, R.A., of 13 Portland Place, W., left net personalty 6,243*l.*, and the gross amounted to 7,476*l.*

THE Housing Committee of the Nottingham Corporation recommend that a housing department for the administration of the law relating to the houses of the working classes should be established, with a chief inspector at a salary of 200*l.* a year, and an assistant at 115*l.* per annum.

MESSRS. HENRY YOUNG & SONS, of Liverpool, will shortly publish a brochure by Mr. J. E. Gerrard, a Liverpool architect, entitled "The Principles of Gothic Mouldings," illustrated with examples taken principally from Lancashire and Cheshire churches.

THE Durham County Council propose (1) To provide a new public elementary school for about 280 children at or near Blackhall Mill, in the parish of Chopwell; and (2) to enlarge the Council school situated at Ushaw Moor, in the parish of Esh, by providing additional accommodation for about 130 children.

SPEAKING last week at a representative meeting of the Dunfermline and West Fife builders, Bailie Stewart, the principal partner of the leading firm of contractors in Dunfermline, said that he had recently had an interview with Sir George M'Crae, Vice-President of the Local Government Board, who had told him that the Government intended to have an establishment of 5,000 men at Rosyth. That number with their families would make a population of at least 20,000. Then there would be an outside population of probably another 20,000, and provision for that large population would have to be made. He indicated that there was an impending boom in the building trade of West Fife.

A CIRCULAR has been issued calling attention to the work of restoring Iona Cathedral. It is pointed out that a good deal still remains to be done. The central tower has to be roofed, in accordance with the original design; the cloister with its arched wall has to be restored and roofed, in order to complete the north wall of the nave, and appropriate furnishings have to be provided for the whole interior. There are other ancient buildings of great historic interest, including the Monastery, the Nunnery, and St. Oran's Chapel, which require repair to ensure their preservation. For the work now in hand, and in course of completion, a sum of 1,274*l.* is required. For the purposes above indicated, a further sum of 3,276*l.* has to be provided. The amount already expended on the work of restoration to May 30, 1910, has been 7,330*l.*

AN important point affecting local authorities and electrical companies was decided on Monday in the Chancery Division by Mr. Justice Neville. The action was brought by the Attorney-General, at the instance of a ratepayer of Leicester, to restrain the Leicester Corporation from carrying on what was called the business of electrical contractors. The Corporation claimed the right not only to supply electrical energy, but also to do the wiring for their consumers and supply them with fittings, &c. His Lordship held that the Electric Lighting Act of 1882 drew a clear distinction between supply and consumption, and that the powers of the Corporation only referred to supply. The wiring and fitting on consumers' premises if "incidental," were "incidental" and necessary to use only, and not to supply. In his opinion supply by the Corporation was to be completed at the consumers' terminals, and that the wiring and fittings were a wholly distinct and separate business. The Corporation had misconceived their powers, and had carried on business in excess of them. The injunction asked for was granted.

THE dispute in the Nottingham building trade with regard to the labourers' working rules has now been settled. The local Conciliation Board having failed to come to an agreement on this matter, the rules as proposed by the Labourers' Society were referred to the Board of Trade, who appointed Mr. A. A. Hudson as arbitrator. Mr. Hudson attended at the Nottingham Exchange when representatives of the Nottingham and District Association of Building Trades Employers and of the Labourers' Society laid the case before him. The arbitrator's award determining the working rules has been received, the principal points of difference between the new rules and the old ones being:—Rule 1.—Wages. Is the same as the old rule except that labourers are to carry nine common bricks, eight facings, and eight blues. Rule 2.—Working hours. Is the same as the old rule with the addition of a clause by which the labourers undertake to agree with any change of the working hours of the bricklayers. Rule 4.—Walking time. This rule is now omitted. Rule 8.—Conciliation. This rule contains an additional clause referring any question, failing agreement by the meeting of six a side, to the local Conciliation Board, and failing settlement by that Board, to Board of Trade arbitration. The other rules have not been altered. The new rules take effect as from the date of the arbitrator's award, viz., June 13, 1910.

THE Great Central Railway Company have issued a twenty-page illustrated pamphlet entitled "An Unique Opportunity." Its object is to bring forward North-East Lincolnshire as the industrial centre offering the most favourable opportunity for the establishment of successful enterprises. The area is bounded on one side by Grimsby, and on the other by Hull, with the great Immingham Docks lying in between. With this eleven-mile coast-line as a base there lies a large area, which offers striking facilities for the establishment of factories. On its borders are the great coal fields, it is linked by railway with the industrial centres of the north, and has water communication *via* the Humber with the great canal systems; along the base line it has a deep water channel which is available for the largest vessels afloat at all tides for the greater part of its length; while the district includes an invaluable iron-ore field. The important industries of the country are gradually cutting adrift from crowded cities and are seeking fresh homes elsewhere. The advantages of north-east Lincolnshire must not be overlooked by inquirers. Copies of the pamphlet can be obtained from Publicity Department, Great Central Railway, 216 Marylebone Road, N.W.

THE Association of Burgh Officials of Scotland held their annual meeting in Glasgow last week. The chairman in moving the adoption of the report said:—Two of the more important Bills passed that affected the Association were the Town Planning Bill and the Finance Bill. He regarded the former as a very objectionable measure—a Bill framed for England alone, and then by a reference clause at the end extended to Scotland. He thought it would have been immensely better if it had been confined to England, and after some experience of its working there a Scottish measure had been passed to attain the same ends. Not only was the Bill very difficult to understand, and the machinery exceedingly complicated, but the regulations that had been issued for its administration were extremely numerous and involved. He had some doubts of the measure being of actual benefit in Scotland, at least in the immediate future. In regard to the Finance Bill, he stated that it introduced the principle of taxing land values for public purposes. The burghs had been looking forward for years to that new source of revenue, and it was to be hoped that they would get a not unimportant share of that revenue, and that they would get it for burgh purposes.

THE annual report of His Majesty's Consul at Vladivostok contains some interesting information with regard to the prospects of an export trade in timber to European markets. Competent persons, he says, are of opinion that the trade has already passed the experimental stage so far as certain species are concerned, and that there should be a possibility of finding a steady market in Europe for Siberian oak, ash, and walnut, which are generally admitted to be superior to the Japanese varieties. It is also hoped that the "kedr," which is a soft fine-grained timber of a light yellowish rose colour, will be able to take the place of the higher grades of yellow pine. Matters to which local lumbermen will have to give serious attention, if they wish the export trade to expand, are the cutting and grading of the timbers. An interesting departure has lately been made in the erection at Okeanskaya, some 15 miles from Vladivostok, of works for the manufacture of veneer, three-ply, and match sticks. Veneers, for furniture making, will be cut from the various local ornamental woods, and, with the three-ply, will be sent to the United Kingdom.

THE annual report of the Deputy Keeper of the Public Records states that during the past year modifications have taken place in the regulations respecting the public use of the records. The date anterior to which public records are considered to be historical has been extended from 1760 to 1800. At the same time the practice of giving the general public unrestricted access to the records having been found to be attended with a certain amount of danger, the Master of the Rolls has directed that in future students wishing to consult them for literary or historical purposes should be granted tickets of admission to the search rooms on giving satisfactory evidence of their respectability and good faith. Holders of such tickets will be permitted to inspect any records in his statutory custody of an earlier date than the year 1801 free of charge, but from all other persons the payment of a search fee will be required. The date down to which the records of several departments of the Government deposited in the Public Record Office are open to public inspection has also been extended. The number of registered applications for the production of records, State papers, &c., in 1909, was 78,561.

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